

**The effects of serial casting on lower limb function for children with cerebral palsy: a systematic review with meta-analysis**

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# ABSTRACT BOOK

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## THE COST-EFFECTIVENESS OF RECOMMENDED ADJUNCTIVE OSTEOARTHRITIS MANAGEMENT OPTIONS IN NEW ZEALAND: RESULTS FROM A COMPUTER SIMULATION MODEL

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**Aim:** In the context of the New Zealand health system, to evaluate the cost-effectiveness of recommended adjunctive treatments for osteoarthritis, provided in addition to core long-term management.

**Design:** A validated state-transition, microsimulation model of the population burden of knee osteoarthritis in New Zealand (the NZ-MOA model).

**Method:** Recommended interventions and their effects and adverse events were sourced from Australian osteoarthritis clinical practice guidelines. We simulated the lifetime incremental quality-adjusted life year (QALY) gains and healthcare costs incurred of nine guideline-recommended adjunctive interventions, in addition to core interventions, education, exercise therapy and (where indicated) weight loss: aquatic-based exercise, heat pack, massage, walking cane, cognitive behavioural therapy (CBT), oral non-steroidal anti-inflammatory drugs (NSAIDs), topical NSAIDs, intra-articular corticosteroids and duloxetine. Population lifetime QALYs and costs were estimated for each intervention when provided in addition to recommended core management, and compared with population lifetime QALYs and costs with core management only.

**Results:** All adjunctive interventions except oral NSAIDs were effective in increasing population lifetime QALYs relative to core treatment only. The largest QALY gains were for walking cane and intra-articular corticosteroids. Walking cane dominated core management only, with higher lifetime QALYs and lower lifetime costs (due to reduced subsequent demand for joint replacement surgery); aquatic exercise, corticosteroids, topical NSAIDs and CBT were also cost-effective.

**Conclusion:** Low-cost, early interventions for knee osteoarthritis have the potential to be highly cost-effective when provided in addition to recommended core long-term management.

### Key Practice Points:

- Adjunctive interventions are cost-effective and should be considered alongside core long-term management.

## RISK OF HIP ARTHROPLASTY IS TRIPLED AFTER SPORTS-RELATED HIP OR THIGH INJURY

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**Aim:** To quantify the likelihood of hip arthroplasty (HA) surgery up to 15 years after sports injury.

**Design:** Population-level cohort study involving data linkage.

**Method:** A cohort was established for the state of Victoria through linkage of two key administrative datasets: the Victorian Admitted Episodes dataset (capturing all hospital admissions) and the Victorian Emergency Minimum Dataset (capturing all emergency department (ED) presentations). Sports injury presentations from 2000-2005 and HA admissions from 2000-2015 were identified using ICD-10-AM codes. Cox proportional hazards models estimated likelihood of HA using time to surgery data, with adjustment for potential confounders.

**Results:** Over the 15-year study period there were 64,750 sports injuries (including 815 hip or thigh injuries) resulting in ED presentation or hospitalisation, and 368 HA procedures. Having a hip or thigh injury tripled the rate of subsequent

HA (hazard ratio 3.07, 95%CI 2.00 to 4.72), compared to all other sports-related injuries. Of the main injury types, femoral fractures (hazard ratio 3.08, 95%CI 1.77 to 5.36) and hip dislocations (hazard ratio 5.64, 95%CI 2.34 to 13.58) were significantly associated with HA.

Conclusion: Sports-related hip or thigh injury is associated with a significantly higher likelihood of HA within 15 years. Effective injury prevention programs and appropriate post-injury management are needed to curtail this burden.

Key Practice Points:

- Greater efforts are needed to increase public and clinician awareness of the potential downstream outcomes following sports-related injuries.
- Timely rehabilitation of sports-related hip and thigh injuries could provide opportunities for preventing the development of symptomatic hip disease.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: While specific rates of sports injuries and hip replacement surgery among Aboriginal and Torres Strait Islander people are unknown, efforts to increase awareness and prevent injuries must encompass all Australians and consider culturally sensitive approaches.

## CURRENT PHYSIOTHERAPY PRACTICE AROUND FALLS PREVENTION IN OSTEOARTHRITIS CARE: A NATIONAL STUDY

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Aim: To investigate physiotherapists' knowledge, beliefs and current practice around falls prevention in osteoarthritis (OA) care.

Design: Cross-sectional study.

Method: Currently registered, practising Australian physiotherapists who care for people with hip and/or knee OA were invited to participate. A comprehensive online survey was used to collect data that were analysed descriptively. Free-text responses were classified into key themes for analysis.

Results: Complete responses were received from 370 eligible physiotherapists, with broad representation across Australian states and community and clinical practice settings. Despite the majority having specific training or access to educational resources, physiotherapists reported only moderate confidence in assessing falls risk (median 7, interquartile range (IQR) 6-8; scale 0 (not at all confident) - 10 (extremely confident)) and delivering falls prevention care (median 7, IQR 6-8). Recent graduates reported the lowest confidence in these areas. While most participants asked about falls history (88%), only 39% used falls risk screening tools and of these, relatively few used appropriate tools. Time constraints (including competing clinical priorities) were the most frequently perceived barrier to including falls prevention activities within OA care.

Conclusion: This national snapshot of contemporary OA practice has revealed clear opportunities for optimising clinician confidence and skills to facilitate the uptake of best-practice falls prevention strategies.

Key Practice Points:

- Only validated tools should be used for falls risk screening and balance assessment among people with lower limb OA.
- The development of OA-focused falls prevention resources (including online training modules) for both newer and more experienced physiotherapists is a priority.

## EFFECTIVENESS OF A WORKSHOP BASED ON FITT-CORRECT PRINCIPLE TO IMPROVE CLINICAL DECISION MAKING SKILLS IN PHYSIOTHERAPY PRACTICE

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**Aim:** To develop educational material for improving clinical decision-making in physiotherapy practice and evaluate its feasibility.

**Design:** Formative design with pre-post pilot study.

**Method:** The traditional FITT principle of exercise prescription (Frequency, Intensity, Time and Type) was modified, adapted and applied to the delivery of a clinical decision making educational workshop for physiotherapy students. FITT was modified to include Combination of interventions, Order of interventions, Repetitions, Rest periods, Exercises at home, Cognitive domains, Total dose (CORRECT). A workshop of three hours was conducted for 54 physiotherapy students. Knowledge in clinical decision-making and confidence in intervention selection and clinical reasoning were measured (VAS where 0: least or no and 10: maximum) before and after the workshop. Wilcoxon signed rank test was used to compare pre-post data.

**Results:** All participants demonstrated significant gain in knowledge regarding clinical decision-making ( $p < 0.001$ ) and significant improvement on confidence level in intervention selection ( $p < 0.001$ ) as well as clinical reasoning ( $p < 0.001$ ). The knowledge gained with the workshop was 7 out of 10 and the effectiveness of the workshop was 8 out of 10.

**Conclusion:** The FITT-CORRECT based workshop material was found feasible and effective for increasing knowledge and confidence in clinical reasoning for physiotherapy students. Future investigations will study this intervention for practicing physiotherapists.

### Key Practice Points:

- FITT-CORRECT principle is an innovative application of exercise prescription principle to transform physiotherapy practice.
- FITT-CORRECT workshops are effective and feasible interventions to improve clinical reasoning and confidence in clinical decision making.

## EXERCISE PARTICIPATION AND OUTCOMES IN FRAIL AND NON-FRAIL HEART FAILURE PATIENTS: RESULTS FROM EJECTION-HF

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**Aim:** This study investigated the impact of frailty on exercise and clinical outcomes in people recently hospitalised with heart failure (HF).

**Methods:** This is a secondary analysis of the EJECTION-HF Trial which investigated the addition of structured exercise training to a disease management programme. A frailty index was constructed using 41 items collected at baseline. Outcomes included exercise programme attendance at six months, physical activity participation at three and six months, change in six minute walk distance (6MWD) at three and six months, all-cause death or readmission at 12 months and HF readmissions within 12 months.

**Results:** More than half (57%) of the 256 participants were classified as very frail or frail. Frail and non frail participants attended the exercise programme equally. Compared to non frail participants, very frail individuals were less likely to be physically active at baseline ( $p = 0.001$ ) and month three ( $p = 0.02$ ) however there was no difference between groups at



month six. Whilst 6MWD was lower at all time points in frail participants ( $p < 0.001$ ), frailty status did not impact upon change in 6MWD. Being physically active improved clinical outcomes for all groups, irrespective of frailty status.

Conclusions: Frail and very frail HF participants are able to participate in and benefit from exercise training programmes and physical activity participation.

Key Practice Points:

- Frailty is common in people recently hospitalised with HF.
- Frail participants with HF should not be excluded from exercise training programmes.

## POOR SLEEP, ANXIETY, DEPRESSION AND INCREASED PHYSICAL ACTIVITY ARE ASSOCIATED WITH INCREASED PAIN IN PEOPLE WITH PARKINSON'S DISEASE

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Aim: To explore the relationships between measures of sleep, mood and physical activity with pain in people with Parkinson's disease.

Design: A cross-sectional study.

Method: Pain was measured using the King's Parkinson's disease Pain Scale and the Brief Pain Inventory (pain severity and interference scales) in 52 participants with Parkinson's disease. Independent variables were categorised by demographics (age, gender), disease severity (Movement Disorders Society Unified Parkinson's Disease Rating Scale) and duration, central sensitisation (Central Sensitisation Inventory), sleep (Pittsburgh Sleep Quality Index), mood (Hospital Anxiety and Depression Scale), and physical activity (Incidental and Planned Exercise Questionnaire). Relationships between independent variables and pain were explored using univariate and multivariate linear regression models.

Results: Univariate regression analyses revealed that increased disease severity, longer disease duration, higher central sensitization scores, impaired sleep and mood, and increased physical activity were associated with increased pain in one or more pain measures ( $p < 0.05$ ). In the multivariate models the adjusted  $R^2$  was 0.25 for the pain severity model, 0.36 for the pain interference model and 0.56 for the King's Pain Scale model. Impaired sleep made an independent contribution to increased pain scores in all models ( $p < 0.05$ ).

Conclusion: Impaired sleep, anxiety, depression and increased physical activity are associated with worse scores on pain scales in people with Parkinson's disease.

Key Practice Points:

- Addressing impaired sleep and mood may assist in the management of pain in people with Parkinson's disease.
- When prescribing exercise programs, pain should be monitored closely for potential exacerbation.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-indigenous population.

## ARE EXERCISE LOGBOOKS ACCURATE? A COMPARISON OF DEVICE AND PARTICIPANT RECORDED EXERCISE RECORDS IN PEOPLE WITH PARKINSON'S DISEASE

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**Aim:** To compare self-recorded logbook exercise adherence records with device-recorded measures to determine: (i) if participant logbook recordings were accurate; and (ii) if there were any patterns to logbook accuracy levels in people with Parkinson's disease.

**Design:** Analysis of the self-recorded logbook and device-recorded exercise adherence measures from participants in the intervention arm of a randomised controlled trial investigating a minimally-supervised upper limb exergame intervention.

**Methods:** Fifteen participants were prescribed at least 3 sessions of 12 games per week for 12 weeks. Logbook and device recorded adherence was calculated. Intraclass correlation coefficients were calculated to determine logbook accuracy.

**Results:** Overall adherence was similar between logbook and electronic records, however there was substantial individual variability. Intraclass correlation coefficients were fair to good for the overall game (coefficient = 0.56) and session (coefficient = 0.66) data, but intraclass correlation coefficients were highly variable among individual participants, ranging from minimal to perfect agreement (coefficients for games -0.24 to 0.99, for sessions -0.02 to 1.0) between logbook and electronic records. The pattern of logbook errors suggested that participants were biasing entries to match the prescribed exercise.

**Conclusions:** Self-report logbooks provided an accurate measure of overall adherence. However, the accuracy of individual logbooks was highly variable, and demonstrated a tendency for participants to record the prescribed exercise regardless of the actual exercise completed.

**Key Practice Point:**

- Logbooks may be reasonably accurate for monitoring group adherence but should not be used in isolation to assess an individual's adherence to exercise.

## POSTURAL CONTROL PREDICTS GROSS MOTOR COORDINATION IN PRIMARY SCHOOL CHILDREN

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**Aim:** To investigate relationships between gross motor coordination and postural control in primary school children, when assessed using short-form and full-scale postural control assessments.

**Design:** A cross-sectional study.

**Method:** Participants were 55 children aged four to 12 years with typical development or Developmental Coordination Disorder and attending mainstream school. Children participated in assessment of motor coordination using the Test of Gross Motor Development, Second Edition (TGMD-2) and postural control using the short-form Balance Subscale of the Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOT-2 Balance Subscale) and the full-scale Kids Balance Evaluation Systems Test (Kids-BESTest). Relationships between measures were examined using Spearman's Rank Correlations, Pearson's Product-Moment Correlations and linear regressions.

Results: The TGMD-2 Total score was strongly correlated with the full-scale Kids-BESTest Total score ( $p=0.60$ ,  $p<0.01$ ) and moderately correlated with the short-form BOT-2 Balance Subscale ( $r=0.45$ ,  $p<0.01$ ). Regressions showed that the Kids-BESTest Total score predicted 39% of the TGMD-2 Total score ( $p<0.01$ ) while the BOT-2 Balance Subscale predicted 19% ( $p<0.01$ ). The short-form BOT-2 Balance Subscale score was strongly correlated with full-scale Kids-BESTest Total score ( $p=0.60$ ,  $p<0.01$ ).

Conclusion: While performance on both postural control measures could predict a substantial proportion of the variance in gross motor coordination, the full-scale Kids-BESTest exhibited the strongest relationship.

Key Practice Points:

- Children with poorer motor coordination demonstrated poorer postural control.
- The full-scale Kids-BESTest of postural control should be used to assess primary school children with motor coordination difficulties in order to improve intervention planning.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## VESTIBULAR MIGRAINE: CAN OCULOMOTOR, VESTIBULAR AND POSTURAL STABILITY MEASURES AID IN IDENTIFICATION OF VESTIBULAR MIGRAINE PATIENTS?

Alsop K<sup>1</sup>, Williams K<sup>1</sup>, Trelevan J<sup>1</sup>, Chipchase L<sup>1</sup>

<sup>1</sup>University Of Queensland, St Lucia, Australia

Aims: To identify clinical assessments and correlations between self-reported vestibular measures and establish sensitivity and specificity from the assessments, to identify vestibular migraine patients versus healthy controls.

Design: A cross-sectional study.

Methods: Patient with vestibular migraines and matched healthy controls were assessed to identify the presence of oculomotor, positional (vestibular), visual and postural sway abnormalities with and without visual overlay and to explore relationships of these findings to self-rated dizziness (Dizziness Handicap Inventory), participation (Vestibular Activity and Participation) and symptom (Visual Symptoms Scale).

Results: Patients with vestibular migraines ( $N=14$ ) were found to have at least one positive oculomotor test ( $p < 0.006$ ) – 93%, as compared to controls ( $N=14$ ), the most common being gaze-evoked nystagmus, vision occluded (64%  $p < 0.002$ ). Positional testing had positive findings of benign positional vertigo, for half of the vestibular migraine patients ( $p < 0.006$ ). Postural stability, firm, eyes closed with and without visual overlay produced significant differences ( $p < 0.03$ ). Oculomotor test and positional assessment showed moderate to good (0.58 to 0.61) correlations to self-reported dizziness and symptoms. Good sensitivity and specificity was identified for oculomotor and positional tests to identify patients with vestibular migraines (81% and 91.7% respectively). Specificity increase with more vestibular and postural tests yet sensitivity declined.

Conclusion: Different oculomotor and positional tests predict identification of patient with vestibular migraine.

Key Practice Points:

- Varied oculomotor and positional tests identify patients with vestibular migraines. This may assist clinician to streamline assessment and treatment options.

Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander people: The predictors identified in this study could be used for Aboriginal and Torres Strait Islander people living with vestibular migraine, however this

population was not specifically investigated. Future research is required to confirm predictors in Aboriginal and Torres Strait Islander people with vestibular migraine.

## ARTHRITIS MANAGEMENT DRUGS AND NUTRITIONAL APPROACHES IN DOGS AND CATS

**Anderson G<sup>1</sup>**

<sup>1</sup>University of Adelaide, Adelaide, Australia

There are many oral and injectable drugs used to alleviate the discomfort of arthritic pain in our small animal patients. Veterinarians, and our pet owners, often use brand names that can be quite confusing. This presentation will review the various types of drugs used, their modes of action, effectiveness and their possible toxicities to heighten awareness of any issues that you may encounter during the physical therapy of patients using these various drugs. The major groups covered will be nonsteroidal anti-inflammatories, synthetic narcotics and centrally acting pain modifiers. Disease modifying nutritional supplements and chondroprotective agents will also be discussed as they are very commonly used in veterinary practice. The learning objectives are to enhance your understanding of the various types of drug and nutraceutical interventions used in small animal practice, their time to onset and duration of action, as well as and what to look for if these agents are causing problems with your physical therapy patients.

## PHYSIOTHERAPISTS SHOULD INCREASE SERVICE PROVISION FOR PEOPLE WITH SEVERE MENTAL ILLNESS

**Andrew E<sup>1</sup>**, Briffa K<sup>1</sup>, Waters F<sup>2,3</sup>, Lee S<sup>1</sup>, Fary R<sup>1</sup>

<sup>1</sup>School of Physiotherapy and Exercise Science, Curtin University, Perth, Australia, <sup>2</sup>Clinical Research Centre, Graylands Campus, North Metropolitan Health Service Mental Health, Perth, Australia, <sup>3</sup>School of Psychiatry and Clinical Neurosciences, University of Western Australia, Perth, Australia

**Aim:** To determine factors influencing access to physiotherapy services to manage the physical well-being of people with severe mental illness from the perspective of the physiotherapist.

**Design:** Mixed-methods.

**Method:** Ninety-eight Australian registered physiotherapists participated, 31 were interviewed in focus groups or individually and 57 completed an online survey. Interview and survey questions were developed to explore physiotherapists' understanding of and attitudes towards severe mental illness; their role in managing physical health in this population; and their need for professional development in the mental health area. Key themes were derived from interviews using an inductive approach. Barriers and enablers of access to physiotherapy were identified. Survey data were analysed using descriptive statistics.

**Results:** Qualitative and quantitative results were complementary. Physiotherapists considered that managing physical well-being of people with severe mental illness was part of their job. However, they reported that limited knowledge and confidence; inadequate service delivery models; and negative perceptions and beliefs about people with severe mental illness affected service delivery.

**Conclusion:** Physiotherapists should be leaders in managing the physical well-being of people with severe mental illness. However, improved education and changes to the model of service provision are needed to improve physiotherapy access for this important yet overlooked population.

**Key Practice Points:**

- Physiotherapists need education to improve their knowledge and confidence to manage physical well-being in people with severe mental illness.
- Current service delivery models do not adequately meet the needs of this population.
- Stigmatisation of people with severe mental illness can affect service delivery.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander People: Identifying mechanisms to improve access to physiotherapy services for a marginalized group such as those with severe mental illness might have carryover to other marginalized groups such as Indigenous Australians, however further research is required to provide specific evidence.

## PEDOMETERS IN AN INPATIENT REHABILITATION POPULATION IMPROVE PHYSICAL ACTIVITY LEVELS BUT NOT FUNCTIONAL MOBILITY

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<sup>1</sup>Tasmanian Health Service, Launceston, Australia, <sup>2</sup>Flinders University, Adelaide, Australia

**Aim:** To determine if pedometers with visible step counts can motivate patients to increase their physical activity levels and improve functional mobility in inpatient rehabilitation compared to those that cannot see their step count.

**Design:** Randomised controlled trial.

**Methods:** Patients (n = 78) admitted to inpatient rehabilitation with reduced mobility and clinician determined capacity to improve were randomly allocated to the intervention or the control group. Both groups received usual care with independent exercise programs and were provided with pedometers. The control group had their pedometers fixed shut and were asked to estimate distance walked daily. The intervention group was able to see their step count. Both groups were encouraged to walk more than the day before. Both groups wore accelerometers continuously for the first seven days. Physical activity was measured by time spent upright and steps taken. Functional mobility was measured by gait velocity and De Morton Mobility Index.

**Results:** The intervention group spent more time upright (hours) (median, IQR: 1.67, 1.77) compared to the control group (median, IQR: 1.12, 0.82; p = 0.004). They also took more steps (median, IQR: 1494, 1214) than the control group (median, IQR: 1146, 1446; p = 0.04). While functional mobility and comfortable walking velocity improved over time, there were no significant differences between groups.

**Conclusion:** Pedometers with visible step counts improved patients' physical activity levels however did not translate to changes in functional mobility.

### Key Practice Points:

- Pedometers improved upright time in this subacute inpatient population but did not improve functional mobility.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on Aboriginal and Torres Strait Islander populations than the non-Indigenous population.

## DEMYSTIFYING MUSCULOSKELETAL PAIN MANAGEMENT: EXPERT PANEL CASE ANALYSIS FROM DIAGNOSTIC, PSYCHOSOCIAL AND OCCUPATIONAL PERSPECTIVES

Austin T<sup>1</sup>

<sup>1</sup>University of Sydney, Sydney, Australia

Assessment and management of the patient with a complex pain presentation can be challenging at the best of times. The presence of mixed pain features, mood issues, feelings of injustice and anger, family, work, financial and lifestyle stressors can leave even the experienced practitioner with confusion over what and how to assess and therefore what management strategies to turn to and to prioritise.

In this Mini-Keynote session, an expert panel of clinicians will aim to deconstruct and simplify the assessment and management of a patient with a complex musculoskeletal pain presentation. We will examine the case study of Paula, whose life has been turned upside down following a motor vehicle accident. Paula's story will likely be representative of many of the patients that present in clinical practice.

The session will cover the comprehensive assessment of Paula through utilisation of a multi-faceted and structured, yet time conscious, approach. The panel will debate both the pertinent findings from the assessment and also strategies for prioritising treatment selection to achieve optimal treatment response. Further deliberation from the panel will then cover factors that may impact possible clinical decision-making processes regarding Paula's ongoing response to treatment. Discussion involving the additional demands of dealing with compensable bodies and other stakeholders will also be covered.

It is the intent of the session for participants to leave the session with an expanded, yet streamlined skillset for working with patients like Paula who present with complex musculoskeletal pain.

#### Key Practice Points:

After this presentation, participants will be able to:

- Understand the benefit of, and how to implement, a structured and time-efficient assessment of a patient with a complex musculoskeletal pain presentation.
- Understand how assessment findings can enhance the clinical decision-making skillset to prioritise treatment selection and deliver improved treatment responses.
- Develop additional skills to continually monitor and address treatment responses and remaining barriers to recovery over the course of intervention.

## SITTING LESS AND MOVING MORE DURING ACUTE HOSPITALISATION: A SCOPING REVIEW OF INTERVENTIONS

**Baldwin C<sup>1</sup>**, Parry S<sup>2</sup>, Norton L<sup>1</sup>, Williams J<sup>1</sup>, Nolan J<sup>3</sup>, Lewis L<sup>1</sup>

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**Aim:** To identify interventions that may influence objectively measured sedentary behaviour and/or inactivity during acute hospitalisation in medical/surgical conditions

**Design:** Scoping review of interventional studies

**Methods:** Four databases (MEDLINE, CINAHL, Scopus and EMBASE) were searched to May 2018. Studies had to include hospitalised adults and objectively measure sedentary behaviour or inactivity with wearable accelerometry. Items were screened for eligibility in duplicate; first by title and abstract, then full text. Reference lists were screened, and authors contacted for publications using similar datasets. Included studies were synthesised descriptively.

**Results:** Fourteen studies were included (n=9 randomised controlled, n=3 pre-post, and n=2 case-controlled trials). Interventions were categorised as: exercise (n=3), patient behaviour change with self-monitoring (n=3), models of care (n=3), implementing system change (n=2), surgical technique (n=2) and wearing day clothes (n=1). Twelve studies reported accelerometer-derived activity. Increases in step count were reported with self-monitoring, an early mobility bundle and by implementing system change. Only three studies measured sedentary behaviour (using thigh worn devices): a resistance training program where accelerometry was not a primary outcome; an outpatient versus enhanced recovery surgical pathway that did not impact sedentary behaviour; and comprehensive geriatric care that increased up-time compared to usual care.

Conclusion: Sedentary behaviour is infrequently measured with accelerometry in the hospital setting. Effective in-hospital strategies to minimise sedentary behaviour are unknown.

Key Practice Points:

- There is a paucity of interventions to address objectively defined sedentary behaviour during hospitalisation.
- Further investigation is warranted to explore different interventions to minimise sedentary behaviour in this setting.

## CLINICAL IMPLICATIONS OF A NORMATIVE DATASET FOR LOWER LIMB ANGULAR VELOCITY AND RANGE OF MOTION DURING WALKING

**Banky M<sup>1,2</sup>**, Mentiplay B<sup>3</sup>, Clark R<sup>2</sup>, Kahn M<sup>1,2</sup>, Williams G<sup>1,4</sup>

<sup>1</sup>Epworth Healthcare, Richmond, Australia, <sup>2</sup>University of Sunshine Coast, Sippy Downs, Australia, <sup>3</sup>La Trobe University, Bundoora, Australia, <sup>4</sup>The University of Melbourne, Bundoora, Australia

Aim: This study aimed to examine lower-limb joint angles and angular velocities in a healthy population walking at various gait speeds.

Design: Observational study

Method: Thirty-six healthy adult participants underwent three-dimensional gait analysis while walking at various speeds. The peak joint angles and angular velocities during key phases of the gait cycle were examined for the hip, knee and ankle in the sagittal plane. Data were grouped in 0.2 m/s increments from 0.4 m/s to 1.6 m/s.

Results: The shape of the gait traces were consistent regardless of walking speed. As walking speed increased, so did the peak joint angles and angular velocities. The largest angular velocity occurred when the knee joint extended during terminal swing. For the ankle and hip, the largest angular velocity occurred during push-off.

Conclusion: This study demonstrated that walking speed had a large impact on joint angles and angular velocity. However, walking speed did not alter the nature of the movement throughout the gait cycle.

Key Practice Points:

- This normative dataset may be used to investigate the ecological validity of strength and spasticity assessment and treatment in a clinical population.
- Given the large influence of walking speed on joint angles and angular velocities, careful consideration of these parameters may be required during assessment and intervention to ensure optimal patient outcomes.
- The results enable the speed and range of motion during a clinical, impairment-based assessment of spasticity and strength to be matched to an individual's walking speed. This may assist in informing effective treatment decision making.

## ESTABLISHING THE ECOLOGICAL VALIDITY OF THE MODIFIED TARDIEU SCALE FOR WALKING IN PATIENTS WITH A NEUROLOGICAL CONDITION

**Banky M<sup>1,3</sup>**, Clark R<sup>3</sup>, Mentiplay B<sup>4</sup>, Olver J<sup>1</sup>, Williams G<sup>1,2</sup>

<sup>1</sup>Epworth Healthcare, Richmond, Australia, <sup>2</sup>The University Of Melbourne, Carlton, Australia, <sup>3</sup>University of Sunshine Coast, Sippy Downs, Australia, <sup>4</sup>La Trobe University, Bundoora, Australia

Aim: This study investigated the ecological validity of the Modified Tardieu scale for walking.

Design: Observational study.

Method: Thirty-six adults with a neurological condition underwent a Modified Tardieu assessment of their quadriceps, hamstrings, gastrocnemius and soleus. Three trials were completed for each muscle, by three different assessors. The joint range of motion and the peak joint angular velocity during each V3 trial was recorded by a three-dimensional



motion analysis system. These parameters were compared to the relevant joint range of motion and angular velocity of healthy people walking at a similar speed. A trial was deemed ecologically valid when the joint range of motion and peak velocity of assessment matched the relevant lower limb movement and angular velocity during the stage of the gait cycle where spasticity is likely to be triggered.

Results: Only 5% of the 2180 trials which were analysed demonstrated ecological validity for all criterion. No trials demonstrated complete ecological validity for stance phase gastrocnemius and soleus or for the quadriceps. The strongest results were for hamstrings at 90° hip flexion where 20% of trials were deemed ecologically valid.

Conclusion: This study demonstrated that the Modified Tardieu scale lacked ecological validity for walking.

Key Practice Points:

- Clinicians assess spasticity too quickly when compared to joint angular velocity during walking.
- Spasticity assessment results may not provide an accurate reflection of lower-limb biomechanics during walking.
- Real-time feedback may be required to improve the ecological validity of assessment and better inform treatment decision making.

## THE FALLACY OF GUIDELINES: ACUPUNCTURE FOR THE TREATMENT OF KNEE AND BACK PAIN

Barlas P<sup>1</sup>

<sup>1</sup>Keele University, Staffordshire, United Kingdom

A number of practice guidelines on the management of osteoarthritis and low back pain have been published in recent years. Despite using similar sources of evidence, guidelines do not always reach the same recommendation. This lecture will focus on the factors that influence the different recommendations, reflect on the variability of methods used to formulate a guideline recommendation, and attempt to address the validity of the current recommendations for the use of acupuncture as a treatment of low back and knee pain.

Key Practice Points:

- Reflect on the recommendations of practice guidelines and their usefulness in current clinical practice.

## EFFECTIVENESS AND SAFETY OF ACUPUNCTURE IN THE TREATMENT OF PREGNANCY RELATED LOW BACK PAIN

Barlas P<sup>1</sup>

<sup>1</sup>Keele University, Staffordshire, United Kingdom

Pregnancy related low back pain is a leading cause of disability on women of childbearing age. The management of this condition has presented a challenge to health professionals given the patient group and the particularities of their condition. Recent studies have highlighted that acupuncture and related techniques can offer relief of the symptoms of pregnancy related back pain and improve quality of life for these women. In this presentation there will be an overview of the current evidence of these techniques and their application in pregnancy related low back pain as well as safety considerations

Key Practice Points

- Outline the effectiveness of acupuncture protocols for the management of pregnancy related low back pain.
- Highlight safety concerns for acupuncture in pregnant women.



## HOW CAN WE BRIDGE THE GAP BETWEEN WHAT WE KNOW AND WHAT WE DO IN CLINICAL PRACTICE?

Barton C, Briggs A, Caneiro JP, Roos E

The burden of disease associated with musculoskeletal conditions, such as osteoarthritis (OA), is enormous and continues to grow. Health systems are struggling to respond and deliver high-value care (i.e. care that is supported by evidence to provide benefit, and that is cost effective and safe). Providing appropriate care at scale for people with musculoskeletal conditions requires reform at multiple levels of the healthcare system – from the clinical environment through to how the system supports care delivery. Where do we start to bridge the gaps between i) burden of disease and system responses and; ii) what we know and what we do, to deliver high value-care?

OA is associated with a 75% co-morbidity (e.g. cardiovascular disease, diabetes, depression, etc.) rate, and provides an illustrative example of the evidence-to-practice-gap in the management of musculoskeletal pain. Physiotherapists are well placed to provide care to people with OA, with patient education and exercise-therapy supported by all guidelines. However, access to physiotherapy is often limited in private and public settings. At the healthcare professional level, clinical guidelines are often undervalued, underused, and rarely provide any 'how to' guidance. This evidence-to-practice gap leads to many healthcare professionals continuing to offer low-value care (i.e. care that is poorly supported by evidence, offers little to no benefit, and exposes to potential harm) across all areas of musculoskeletal care.

Our team's research investigating the drivers of evidence-to-policy and evidence-to-practice gaps in OA care, alongside developing options to facilitate physiotherapy-led high-value care provides important lessons on how we can bridge the current care disparity gaps for musculoskeletal conditions.

### Key Practice Points:

- Discuss health system strengthening for OA in Australia.
- Describe initiatives to change health policy and services based on the implementation of models of care.
- Discuss physiotherapist-led initiatives to illustrate how clinical practice (what we do) can be changed by the implementation of research evidence (what we know).

## BETTER EDUCATION AND EXERCISE-THERAPY FOR PEOPLE WITH PATELLOFEMORAL PAIN (BEEP): PILOT STUDY OF STAGED CARE

Barton C<sup>1,2</sup>, Pazzinatto M<sup>1,3</sup>, Crossley K<sup>1</sup>, de Azevedo F<sup>3</sup>, de Oliveira Silva D<sup>1,3</sup>

<sup>1</sup>La Trobe Sport and Exercise Medicine Research Centre, Bundoora, Australia, <sup>2</sup>Department of Surgery, St Vincents Hospital, University of Melbourne, Melbourne, Australia, <sup>3</sup>University of Sao Paulo State – Faculty of Science and Technology (FCT/UNESP) – Physiotherapy Department, Sao Paulo, Brazil

**Aim:** Evaluate outcomes of people with patellofemoral pain (PFP) following (i) 6-weeks of self-directed management using a web-based multimedia education and exercise-therapy platform ('My Knee Cap'); and (ii) an additional 12-weeks of physiotherapy-led education and exercise-therapy (face-to-face or online) for those who were not completely recovered following self-directed management.

**Design:** Randomised controlled trial

**Method:** Thirty-three people with PFP (31±5 years) were recruited. Outcomes included global rating of change (7-item Likert scale; self-reported recovery defined as 'completely recovered' or 'markedly better') and worst pain in the previous week (VAS 0-100mm). Phase 1 (0-6 weeks): All participants accessed the 'My Knee Cap' platform for 6-weeks. Phase 2 (6-18 weeks): Participants not rating themselves as 'completely recovered' after phase 1 were randomised to 8 physiotherapy sessions delivered (i) face-to-face; or (ii) via Skype®.

**Results:** Phase 1: 42% (14/33) self-reported recovery following 6-weeks self-directed use of the 'My Knee Cap' platform, with 21% (7/33) reporting 'complete recovery'. Phase 2: 76% (25/33) self-reported recovery at 18-weeks, alongside large

improvements in pain (ES, 95%CI=1.88, 1.22 to 2.63). No differences in outcomes were found between face-to-face (n=13) and Skype® (n=13) interventions at 18-weeks.

Conclusion: A high proportion of people with PFP reported recovery following self-management using the 'My Knee Cap' platform. Face-to-face and online exercise-therapy and education produced similar outcomes, indicating both may benefit those seeking physiotherapy after a trial of self-directed management.

Key Practice Points:

- Self-directed management using a web-based platform may minimise the need for more resource-dependent care.
- Face-to-face and online physiotherapy produce similar outcomes.

## CONCUSSION – BEST PRACTICE & PHYSIOTHERAPY

Bayley M<sup>1</sup>

<sup>1</sup>Toronto Rehabilitation Institute, Toronto, Canada

Concussion is also known as a mild traumatic brain injury and is increasingly being recognized. Unfortunately, with raised awareness there has been increasing controversy over the causes of persistent symptoms following concussion. Physiotherapists have been increasing role in assessing and treating symptoms associated with concussion including exercise intolerance, neck pain and dizziness.

By the end of this presentation, participants should be able to:

- Name some best practice guidelines for care of concussion and some of the barriers and facilitators to implementation of best practices.
- Debate the current state of evidence for return to exercise and activity following concussion.
- Describe the current state of best practices for treatment of vestibular disorders post-concussion and the role of treatment of neck pain may have in management of post-concussion headaches.

## GUIDELINE BASED CARE FOR THE MANAGEMENT OF WORKERS COMPENSATION CLIENTS: IMPLEMENTATION FOR MUSCULOSKELETAL PHYSIOTHERAPISTS

Beales D<sup>1</sup>

<sup>1</sup>School of Physiotherapy and Exercise Science, Curtin University, Perth, Australia

Aim: Guidelines for managing workers compensation clients and musculoskeletal disorders in general have been formulated to assist the translation of evidence into practice. It is unclear how well these guidelines have been adopted in clinical practice by physiotherapists in compensable environments.

Design: Retrospective audit of closed workers compensation claims.

Method: Audit of closed compensation claims for shoulder (n=189) and hip disorders (n=44) involved the extraction of demographic, clinical and billing data. Onset of different elements of care were determined based on the billing for a service (formal exercise intervention, diagnostic imaging, injections, surgery). Patterns of billing were compared to guideline-based recommendation. Associations between service delivery and claim outcomes (claim duration, claim costs) were calculated.

Results: Shoulder Claims: Median time to start formal exercise was 27 days, versus 11 days for diagnostic imaging. Each day delay for formal exercise was associated with increased claim duration and costs.  
Hip Claims: A pathological diagnosis (median 49.5 days) was associated with a delay in formal exercise intervention compared to lateral (14 days) or non-specific (4.5 days) hip pain. There was an association between time to exercise and claim duration.

Conclusion: People with compensable shoulder and hip claims frequently receive care that does not match guideline-based recommendations. Delayed access to guideline-based care like formal exercise is associated with poorer claim outcomes.

Key Practice Points:

- Physiotherapists will understand guideline-based care pathways for compensation claims.
- The results provide an impetus for physiotherapy lead health promotion to general practitioners to facilitate earlier referrals and better outcomes for workers.

## CAREER PATHWAY FOR PHYSIOTHERAPISTS: A ROLE FOR THE AUSTRALIAN COLLEGE OF PHYSIOTHERAPIST IN PROFESSIONAL ENDORSEMENTS

Beales D<sup>1</sup>

<sup>1</sup>*Pain Options, South Perth, Australia*

Aim: In response to the needs of the profession, the Australian Physiotherapy Association has prioritised provision of a more structured career pathway for physiotherapists in Australia. The purpose of this presentation is to discuss the structural changes within the Australian College of Physiotherapists to facilitate implementation of a post-graduate career pathway across the profession. Attention will be paid to the need for professional endorsements.

Design: Narrative review and discussion.

Method: Not applicable.

Results: The Australian College of Physiotherapists is in the process of a restructure to better assist its purpose to be the 'custodian of the career pathway' within the Australian Physiotherapy Association. The competency framework has been endorsed and structured with four milestones (foundation, intermediate, highly developed, expert). Work is now proceeding on the development of an education framework and an assessment framework. Under this structure and framework, the emergence of new professional clusters is occurring. This includes the group for Advanced Musculoskeletal Physiotherapy practice. A national level of endorsement is seen as a necessity for unifying what is a partially fragmented physiotherapy workforce sector.

Conclusion: The Australian College of Physiotherapist is well placed to provide professional endorsements, recognised nationally.

Key Practice Points:

- Physiotherapist will understand the stages career pathway for physiotherapists.
- Physiotherapists will be informed of the different endorsement points along the pathway.

## FIGHTING SOCIAL INJUSTICE: STORIES FROM THE FRONT LINES OF PHYSIOTHERAPY PRACTICE

Beard M, Ferrar, K

Physiotherapists aim to improve the health of clients and communities, yet the poor health of many people is produced by social inequalities. Unjust social and economic conditions can create health inequities between groups of people. Unequal access to the benefits of our society, including physiotherapy and healthcare, can have devastating effects on quality and length of life. Physiotherapists are aware of this influence in the biopsychosocial model but can be uncertain how to address disadvantage and inequity they witness affecting communities. In this presentation you will hear how two South Australian physiotherapists have provided access to physiotherapy for a group of people who experience significant health inequity. You will learn how you can translate their ideas to your own practice or determine your own path to address social injustice and health inequity as a physiotherapist.

## TRANSFORMING THE 11+ INTO ACL PREVENTION

**Beerworth K<sup>1</sup>**

<sup>1</sup>Football Federation Australia, Sydney, Australia

With the explosive rate in growth of women's sport in Australia, the increased injury risk for females in some sports has received increasing media attention. The challenge for all involved is to implement effective prevention programs and training regimes that mitigate injury risk. However, just because an intervention such as the FIFA 11+ is efficacious in a controlled trial does not mean that it will be widely adopted and have an impact in the real world. In this workshop, Kate will discuss strategies around how we can all work towards implementing such programs into everyday practice and help make sport safer for all.

## AVOIDING A KNEE JOINT REPLACEMENT SURGERY. A CASE STUDY

**Bell E<sup>1,2</sup>**, Wallis J<sup>1,2</sup>, Crossley K<sup>1</sup>, Barton C<sup>1,3</sup>

<sup>1</sup>Sport and Exercise Medicine Research Centre, School of Allied Health, La Trobe University, Bundoora, Australia, <sup>2</sup>Department of Physiotherapy, Cabrini Health, Malvern, Australia, <sup>3</sup>Department of Surgery, St Vincent's Hospital, University of Melbourne, Melbourne, Australia

**Aim:** To describe a case study that highlights the value of accessing exercise-therapy and education prior to knee joint replacement surgery.

**Design:** Retrospective case study

**Method:** This case study describes a 66 year old male patient awaiting knee joint replacement surgery. Routine cardiac screening led to the requirement for cardiac artery bypass grafts and a subsequent 6-week cardiac rehabilitation program. This was followed by referral to an 8-week exercise-therapy and education program to address ongoing knee pain- Good Living with OsteoArthritis from Denmark (GLA:D<sup>®</sup>). Standardised patient reported and activity outcomes associated with each program were measured pre and post their completion.

**Results:** Following cardiac rehabilitation: Improved 6-minute walk test from 330m to 460m (39% increase). Following GLA:D<sup>®</sup>, 30-second chair stand test improved from 11 to 13 (18% increase), average daily pain reduced by 65%(8 to 2.5) on a 10cm Visual Analogue Scale, and Knee Osteoarthritis Outcome Score increased from 19 to 69 points. At 1-year follow-up this patient is still willing to forgo knee joint replacement surgery.

**Conclusion:** A combination of physiotherapy-led exercise-therapy and education targeted to manage heart disease and knee osteoarthritis prevented the need for a knee joint replacement surgery by at least 1-year in this case study.

**Key Practice Points:**

- Accessing exercise-therapy and education programs can prevent or delay the need for knee joint replacement surgery.
- Alongside cardiac screening, prior participation in exercise-therapy and education programs may provide a valuable screening criteria before considering joint replacement surgery.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research is not specific to Aboriginal and Torres Strait Islander people and therefore improved results are not relevant in this case study.

## ACTIVATION OF MOTOR-RELATED NEURAL SUBSTRATES IN MIRROR-INDUCED VISUAL ILLUSION: AN ACTIVATION LIKELIHOOD ESTIMATION META-ANALYSIS

**Bello U<sup>1</sup>**, Kranz G<sup>1,2</sup>, Chan C<sup>1</sup>, Winser S<sup>1</sup>

<sup>1</sup>The Hong Kong Polytechnic University, Hung Hom, Hong Kong, <sup>2</sup>Medical University of Vienna, Austria

**Aim:** To understand the roles of motor-related processes during the mirror-induced visual illusion generated from mirror therapy paradigm among healthy individuals.

**Design:** Meta-analysis of results of studies using functional magnetic resonance imaging (fMRI) on healthy subjects experiencing the mirror-induced visual illusion.

**Method:** We searched the CINAHL, MEDLINE, Scopus and PubMed databases until (date) and included eight studies (with 14 experiments and 163 activation foci) that met the inclusion criteria. Activation foci were pooled by employing Activation Likelihood Estimation (ALE) meta-analysis.

**Results:** When contrasting with resting condition, activation clusters were identified in the bilateral primary motor cortex [X, Y, Z coordinates: -40, -10, 56 and 38, -22, 54] and premotor area [-28, -8, 56 and 60, 4, 30]. Activations were also revealed in the cerebellum [-8, -58, -10] and precuneus [-26, -56, 60] contralateral to the side of the static limb behind the mirror. ALE maps were computed at 1000 threshold permutation, cluster-forming threshold at voxel level  $p < 0.001$ . These brain areas are associated with attention control, motor planning and control, and self-processing operations.

**Conclusion:** It is indicative that mirror-induced visual illusion elicited motor and attention processes which are mediated by motor and motor-associated cortical and sub-cortical brain areas.

**Key practice point:**

- This research provides quantitative evidence for the modulatory effect of mirror-induced visual illusion. This potentially serves as the neural basis for the mirror therapy associated motor recovery.

## VALIDITY AND RELIABILITY OF CLINICAL PALPATORY METHODS TO ASSESS DIASTASIS RECTI OF THE ABDOMINAL MUSCLES IN POST-NATAL WOMEN

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**Aim:** Research to date on the measurement properties of assessment methods relating to diastasis of the rectus abdominis muscles has been characterised by design flaws, lack of standardisation of protocol and using palpatory methods that have not been robustly investigated in terms of their validity and reliability. The aim of this study is to determine the: (i) concurrent validity of clinical palpatory methods (finger-width measurement, calipers, tape measure) to evaluate the width of diastasis recti of the abdominal muscles compared to the ultrasound criterion; (ii) and inter-rater and retest reliability of these palpatory methods.

**Design:** Validity and reliability study.

**Methods:** Two physiotherapists assessed the inter-recti width of rectus abdominis on 50 post-natal women using clinical palpatory methods of finger-width, tape measure and caliper in a blinded manner using standardised protocol. These measurements were compared to the ultrasound criterion for validity. The palpatory methods were also assessed for inter-rater and retest reliability.

**Results:** Calipers were found to have strong to very strong positive linear correlation with the ultrasound criterion, with small mean differences and limits of agreement. It also was found to have good to excellent agreement in inter-rater and retest reliability. Finger-width and tape measure were also found to have strong correlations, however mean differences and limits of agreement were wider in validity and reliability testing. Screening for the presence of diastasis using palpatory methods compared to the ultrasound, confirmed calipers were the most sensitive and specific to identify diastasis presence, and finger-width the least sensitive and specific.

**Conclusion:** Calipers are a sensitive, specific, valid and reliable palpatory measurement tool with strong correlation and agreement with the ultrasound criterion, and good inter-rater and retest reliability.

#### Key Practice Points:

- Calipers have good agreement with ultrasound.
- Calipers have good to excellent inter-rater and retest reliability.

## NAVIGATING THE WORKPLACE AS A YOUNG PERSON WITH INFLAMMATORY ARTHRITIS

**Berkovic D<sup>1</sup>**, Briggs A<sup>2</sup>, Ackerman I<sup>1</sup>, Ayton D<sup>1</sup>

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**Aim:** To examine the work-related experiences of younger people (aged 18-50 years) living with inflammatory arthritis (IA).

**Design:** Qualitative exploratory study.

**Methods:** An interview guide was developed based on the World Health Organization's International Classification of Functioning, Disability and Health. Deductive and inductive coding techniques were used to identify existing and emerging work-related themes.

**Results:** Semi-structured interviews were conducted with 21 young people with inflammatory arthritis conditions (rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, and juvenile idiopathic arthritis) across differing vocations and career stages. Three main themes were identified: (1) the perceived impacts of arthritis on individual career trajectory, (2) the impacts of arthritis on participants' workplace environment, employers, relationships with employers and colleagues, and (3) the personal burden of working with arthritis. Participants discussed a range of arthritis-attributable workplace limitations and challenges. Participants in administrative roles identified high-dexterity tasks as challenging, while those in more physically demanding roles identified loading-based tasks as a limitation. Arthritis also impacted career choice from the perspective of adolescent participants attempting to choose their university degree, and early exit from the workforce for those with more established careers.

**Conclusion:** Young people with arthritis face numerous challenges at multiple stages across their careers, at both an individual and workplace level.

#### Key Practice Points:

- Understanding the work impacts of IA at key career stages is essential for tailoring appropriate rehabilitation and fostering supportive work environments.
- Physiotherapists should discuss IA-related work capacity and consider strategies to maximise work productivity and career participation.

## INFORMATION PROCESSING POTHOLES IN PEOPLE WITH PERSISTENT PAIN – IS THERE SPACE FOR SMOOTHING THE WAY?

**Berryman C<sup>1</sup>**

<sup>1</sup>The University of Adelaide, Adelaide, Australia

Persistent pain loses its utility to protect and motivate people to move away from danger. Instead, it often increases vigilance to pain-related information and switches the motivation for goal-directed behaviour from hedonistic to pain control goals. Cognitive and motivational disturbances play a critical role in information processing and may present largely unrecognized barriers to goal setting.

Best practice guidelines for persistent pain management recommend client centred, goal-oriented care that includes pain education, activity re-engagement and active self-management. Those recommendations require adequate executive function. Consistent with observed changes in information processing in persistent pain, neuroimaging outcomes demonstrate altered brain structure and function which could impair executive function. Taken together

these findings suggest that biological factors are capable of impairing an individual's ability to constructively adapt (or develop) and follow through on goals necessary for improvement. This presentation is a synthesis of current knowledge of biological factors thought to underpin the expression of cognitive impairment in people with persistent pain, including investigations by the author, and will present some known and some speculative suggestions for application in clinical practice.

#### Key Practice Points:

- Cognitive impairment in people with chronic pain may be a barrier to improvement.
- Working memory and cognitive flexibility are associated with structural and functional brain changes in people with chronic pain.
- Impaired working memory can impact the ability to learn new information. Impaired cognitive flexibility can impact the capacity to look at a problem from a different perspective, a skill that mediates interventions such as acceptance commitment therapy.
- Chunking information may be used clinically to mitigate the effects of impairment in working memory and approaching the pain condition with curiosity may be used clinically to encourage improvement in cognitive flexibility.

## CHANGES IN EXERCISE CAPACITY AND HEALTH-RELATED QUALITY OF LIFE AT FOUR AND EIGHT WEEKS OF PULMONARY REHABILITATION

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**Aim:** To determine the changes in exercise capacity and health-related quality of life at four and eight weeks during a twice-weekly supervised pulmonary rehabilitation (PR) program in people with chronic obstructive pulmonary disease (COPD).

**Design:** Prospective cohort study.

**Method:** Participants with COPD were recruited and attended PR twice-weekly for eight weeks. Endurance shuttle walk test (ESWT), six-minute walk distance (6MWD) and St George's Respiratory Questionnaire (SGRQ) were measured at baseline, four and eight weeks. Physical activity was recorded over seven days at baseline and week seven with an ActivPAL.

**Results:** Forty-seven participants were recruited and 40 completed eight weeks of PR (mean [SD] age 69 [7.6] years, male 55%, FEV1% predicted 48 [18.2]). At four weeks there were significant improvements in ESWT [mean difference (95%CI)] [171 seconds (59, 308)]; 6MWD [23 metres (9, 36)] and SGRQ [-3.4 points (-6.3, -0.4)]. At eight weeks compared to baseline, there were significant improvements in: ESWT [286 seconds (153, 418)]; 6MWD [34 metres (20, 49)] and SGRQ [-5.6 points (-9.2, -1.9)]. By week seven there was a non-significant increase in steps per day (231 steps (-515, 977)).

**Conclusions:** While all outcomes improved by four weeks of PR, these did not reach the minimally important differences in ESWT, 6MWD or SGRQ, which were all reached by eight weeks. There were no changes to physical activity.

#### Key Practice Points:

- This study supports the need for PR to exceed four weeks to achieve minimally important improvements in exercise and health-related quality of life outcomes.

**Trial Registration:** ACTRN12616001586404



## SUPPORTING PHYSIOTHERAPISTS TO BUILD CONFIDENCE FOR WORKING WITH COMPLEX AND DETERIORATING PATIENTS

**Blunt A<sup>1</sup>**, Vegh L<sup>1</sup>, Paratz J<sup>2</sup>

<sup>1</sup>Princess Alexandra Hospital, Woolloongabba, Australia, <sup>2</sup>Griffith University, Brisbane, Australia

**Aim:** To investigate physiotherapists' satisfaction and perceived confidence working with deteriorating patients after the introduction of a physiotherapy "ICU Outreach" service.

**Design:** A new model of care was implemented by experienced physiotherapists at a large tertiary hospital in April 2018. This service focused on early recognition and response to respiratory deterioration, performing extra or joint treatments with ward physiotherapists and delivering education including patient simulations targeted at deteriorating patients. A range of qualitative data including staff satisfaction, self-rated confidence and simulation evaluation data was collected before and after the introduction of the new service.

**Method:** Electronic surveys, semi-structured group interviews and paper-based evaluations.

**Results:** Staff surveys and focus groups reported strong themes of physiotherapists feeling well supported by the service when managing complex and deteriorating patients, particularly amongst newly graduated physiotherapists. There was no demonstrated change in physiotherapists self-perceived confidence levels for managing deteriorating patients. Evaluation forms collected from the physiotherapists who participated in simulations (n=20) revealed high agreement with statements that the simulation scenarios were a valuable learning experience (85% strongly agree/15% agree) and developed their clinical decision making abilities (75% strongly agree/25% agree).

**Conclusion:** Physiotherapy education and support delivered using an "ICU Outreach" model of care was valued by physiotherapists managing complex and deteriorating patients.

**Key Practice Points:**

- Less experienced physiotherapists often describe a lack of confidence managing deteriorating patients.
- Education and support for physiotherapists managing deteriorating patients can be delivered via a number of approaches including joint treatments with more experienced physiotherapists, and patient simulations.

**Funding source:** Metro South Health Executive Planning and Innovation Committee  
HREC/18.QPAH/430 – SSA/18/QPAH/431

## PHYSIOTHERAPY "ICU OUTREACH" IS FEASIBLE, HAS HIGH STAFF SATISFACTION AND MAY REDUCE INTENSIVE CARE READMISSIONS OF RESPIRATORY CAUSE

**Blunt A<sup>1</sup>**, Vegh L<sup>1</sup>, Paratz J<sup>2</sup>

<sup>1</sup>Princess Alexandra Hospital, Woolloongabba, Australia, <sup>2</sup>Griffith University, Brisbane, Australia

**Aim:** To investigate the feasibility, staff satisfaction and potential impacts on patient flow at a major tertiary hospital after the introduction of a new "ICU Outreach" physiotherapy service focusing on early detection and management of respiratory deterioration.

**Design:** Quantitative and qualitative data was collected from a range of sources to evaluate service activity, patient outcomes and staff satisfaction.

**Method:** Analysis of databases, electronic surveys, and semi-structured group interviews.

**Results:** A new model of care where experienced physiotherapist provided additional assessments, treatment, staff education and support was implemented within one month. Service activity targets were met and post-implementation surveys revealed high levels of staff satisfaction from physiotherapists (90%) and medical/nursing/other allied health (97%). Referral indications included post complex ICU stay, post respiratory Rapid Response call, tracheostomy support,



or major spinal, head or chest trauma. Analysis of six months of ICU readmission data revealed a relative reduction in ICU readmissions of respiratory causes from 41.30% to 30.77% after the introduction of the new service when compared to the same period from the previous year.

**Conclusion:** A physiotherapy service similar to traditional “ICU Outreach” can support physiotherapists caring for patients with/at risk of respiratory deterioration and may improve patient outcomes such as reducing ICU readmissions. This new service was highly utilised and valued by physiotherapists and other staff.

**Key Practice Points:**

- New cardiorespiratory physiotherapy “ICU Outreach” models of care for complex and deteriorating patients can be successfully implemented.
- Early detection and management of respiratory deterioration by physiotherapists can improve patient outcomes.

**Funding source:** Metro South Health Executive Planning and Innovation Committee  
HREC/18.QPAH/430 – SSA/18/QPAH/431

## LESSONS LEARNED ABOUT PAIN FROM THE GLOBAL BURDEN OF DISEASE STUDY

**Blyth F<sup>1</sup>**

<sup>1</sup>University of Sydney, Sydney, Australia

In the last five years, there has been consistent evidence from the Global Burden of Disease Project that pain conditions are a major driver of the global burden of disease, due to the high disability burden attributable to pain. However, the nature and impact of pain burden differs between high resource and low resource countries. Ageing of the global population will be a key driver of future pain burden. Despite the strong signal about the size of the global pain burden, there has been little evidence that this has resulted pain conditions being included in the global health agenda. What we now know about pain burden can be translated into research and policy responses, and has implications for pain practice.

**Key Practice Points:**

- Burden of pain evidence can be included in strategies to seek better resources for people with pain at a health system level.

## DIFFERENCES IN RUNNING GAIT VARIABILITY BETWEEN INDIVIDUALS WITH AND WITHOUT MUSCULOSKELETAL INJURY: A SYSTEMATIC REVIEW

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<sup>1</sup>University of Newcastle, Ourimbah, Australia, <sup>2</sup>La Trobe University, Melbourne, Australia

**Aim:** To determine whether variability in lumbopelvic and lower limb motor output differs between individuals with and without injury throughout the running gait cycle.

**Design:** Systematic review.

**Method:** Five databases (Medline, CINAHL, Embase, SPORTDiscus and Cochrane library) were searched from inception to October 2018. Included studies: (1) examined adults with a lumbopelvic or lower limb musculoskeletal injury, (2) had a running task, (3) had a control group, (4) investigated movement variability as a dependent variable, and (5) provided a between-group statistical analysis. Studies were excluded if they investigated neurological disorders or examined the upper limb and/or cervical spine.

**Results:** Two researchers independently screened 534 records for eligibility: 30 studies were selected for full-text screening and 20 of these studies were eligible for inclusion in the current review. Most studies were found to be of

moderate quality, with no studies rated as poor. Meta-analysis was not possible due to heterogeneity of movement variability assessment tools.

Conclusion: Individuals with musculoskeletal injury displayed altered motor output variability compared to uninjured individuals during running tasks.

Key Practice Points:

- Certain variations in motor output may contribute to running related injuries.
- Assessment of running gait may assist clinicians in identifying pathological deviations in running gait that can then be addressed as part of a larger rehabilitation program.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## USING NON-INVASIVE BRAIN STIMULATION TO BOOST THE HYPOALGESIC EFFECTS OF EXERCISE

**Borovskis J<sup>1</sup>**, Cavaleri R<sup>1</sup>, Blackstock F<sup>1</sup>, Summers S<sup>1,2</sup>

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Aim: To determine whether transcranial direct current stimulation (tDCS) can augment exercise-induced hypoalgesia (EIH) in healthy individual's experiencing persistent experimental muscle pain.

Design: Pilot randomised, double blinded, sham-controlled experimental trial

Method: Twenty healthy subjects attended two experimental sessions (Days 0 and 2). On Day 0, subjects were injected with nerve growth factor into their right forearm extensor muscle to induce persistent elbow pain over two consecutive days. Two days later (Day 2), each subject performed a single bout of exercise (3-minute isometric gripping task using their right arm) immediately after 20min of either active (intervention) or sham (placebo) tDCS over the motor cortex. Pain sensitivity (pressure pain thresholds [PPTs]), muscle soreness, and descending pain inhibition (condition pain modulation [CPM]) were assessed prior to injection, before tDCS on Day 2, and immediately after and 15 min post exercise.

Results: PPTs were no different immediately after and 15min post exercise in the intervention than control group ( $p > 0.72$  for all). Muscle soreness and CPM were similar for both groups following exercise ( $p > 0.28$  for both).

Conclusion: tDCS does not augment the EIH response in healthy individuals experiencing persistent muscle pain, nor does it impact CPM. Larger experimental trials are required to confirm these findings.

Key Practice Points:

- TDCS over the motor cortex does not augment EIH in healthy individuals experiencing persistent muscle pain.
- Adding TDCS to exercise may not enhance EIH more, than exercise alone.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## COMMUNITY AND GLOBAL HEALTH: THE ROLE OF GERIATRIC PHYSICAL THERAPY IN PROMOTING HEALTH

**Bottomley J**<sup>1</sup>

<sup>1</sup>*Simmons University, Boston, United States*

Physiotherapists play a major role in health promotion and are under-utilized in many settings. It is the responsibility of physiotherapists to step up to the plate in contributing to the health and well-being in aging populations in community and global health care settings. The burden of disease increases with increased inactivity – which leads to the cascading events of increased disability, functional loss and a decrease in the quality of life. Physiotherapists are the experts in activity and exercise prescription and also have the knowledge to make healthy lifestyle choices recommendations. As gatekeepers in the health care system, we play a role in referrals to other disciplines for health-related issues and other important components of health such as nutrition, medication use, stress management and the like. We could play a larger role in health education and in the integration of physiotherapy into disease prevention and disease management. In addition, this lecture will address health care disparities, the impact of climate change, and opportunities for working with community and global health care providers across the spectrum of care.

### Key Practice Points:

- Understand the role that physiotherapy plays in health promotion for aging communities and global societies.
- Discuss the impact of socioeconomic issues on health education and physiotherapies role in addressing the need.
- Understand the double burden of disease, disability and quality of life.
- Understand the impact of climate on global health.
- Explore International volunteer and learning opportunities.
- Reflect and report on experience working with community and global partners.

## PHYSIOTHERAPY APPROACHES IN MEDICALLY-COMPLEX AND FRAIL: RESETTING OUR PERSPECTIVE

**Bottomley J**

The Australian population is ageing rapidly and with age an increase in co-morbidities and a decline in abilities is seen. Frailty is an often-used term to indicate a higher risk to adverse health outcomes. This seems to be a simple concept however in daily practice it is awkward for physiotherapists to work with the term frailty. Frailty is complex and dynamic and is often not recognized by the patient themselves. In this lecture the multiple dimensions of frailty will be addressed and the usefulness in daily practice for physical therapists.

Frailty is a complex phenomenon which is a result of a decline in reserve capacity. Although it is generally known that movement has a positive influence on a diversity of health outcomes in relatively healthy elderly, the effect on frail elderly is less known. Looking at the multi-dimensionality of frailty physiotherapists must be aware that next to physical frailty there can be also a decline in psycho-cognitive reserve capacity as well as decline in social resources.

## “SELLING NOT TELLING” ..... IT’S RELEVANT TO OHP PRACTICE – WORKING WITH EMPLOYERS & WORKERS

**Bouvier A**<sup>1</sup>

<sup>1</sup>*Macquarie University, Sydney, Australia*

In this engaging and interactive presentation, she will explore the challenging and ever changing landscape of creating engagement and compliance in the OHP space.

With a focus on identifying clear value propositions for both employee and the employer, we will step back from the traditional medical focus of telling people what they “should” do and explore ways to bring them on the journey

Key areas which will be covered, include

- Understanding patient motivation
- Creating the Journey
- Communication- when less is more
- Exercise v habit formation
- Milestones and markers- how do I know things are improving?
- Snackability, delight and program design

## NOCTURNAL BLADDER DYSFUNCTION FROM PAEDIATRICS TO GERIATRICS

**Bower W<sup>1,2</sup>**

<sup>1</sup>Royal Melbourne Hospital, Melbourne, Australia, <sup>2</sup>The University of Melbourne, Melbourne, Australia

During the night urine production rate should fall, allowing the bladder to store until morning. In both children and adults there can be a mismatch between early and late night diuresis rate and habitual bladder storage. This is further compounded by changes in both arousal and sleep. During the early years and again in later life nocturnal bladder storage may be dysfunctional. The clinically-relevant comorbid conditions that predispose to nocturnal lower urinary tract symptoms vary but include nocturnal polyuria, sleep disruption, neurogenic/ overactive/ underactive bladder, increased bladder outlet resistance, comorbid disorders, such as heart failure, sleep apnoea, diabetes or third space sequestration and slow walking speed. Additional risk factors for nLUTS are conferred by acute and chronic illness interacting with medications and the physical environment. This presentation will describe the pathophysiology underlying the nocturnal lower urinary tract symptoms (nLUTS) of nocturia (waking to pass urine), enuresis, urinary urgency, urgency incontinence, stress incontinence and voiding dysfunction across the lifespan.

## NOCTURIA, A MARKER OF POOR HEALTH

**Bower W<sup>1,2</sup>**

<sup>1</sup>Royal Melbourne Hospital, Melbourne, Australia, <sup>2</sup>The University of Melbourne, Melbourne, Australia

Nocturia is a common symptom of many conditions and is encountered in patients presenting to different specialties, disciplines and services. There are significant interactions between voiding at night and metabolic, cardiovascular, hormonal, mental health, sleep and inflammatory changes that flag nocturia as a likely marker of co-morbid poor health. As the causal pathway of nocturia is multi-factorial patients should be comprehensively evaluated for all-causes of nocturia since multiple aetiologies commonly co-exist. This presentation will describe the development and utility of a symptom-specific screening metric to guide diagnosis of all contributing causes of nocturia. The interrelationships between causes of nocturia guides multi-modal intervention. Treatment strategies can be implemented by all health professionals; evidence underlying treatment efficacy will be presented.

## SEEING DOUBLE: A CASE REPORT ON THE MANAGEMENT OF ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTIONS IN IDENTICAL ADOLESCENT TWINS

Camilleri L<sup>1</sup>, Bade D<sup>2</sup>, **Bradford K<sup>2</sup>**, Carty C<sup>2</sup>

<sup>1</sup>Department of Physiotherapy, Queensland Children's Hospital, South Brisbane, Australia, <sup>2</sup>Department of Orthopaedics, Queensland Children's Hospital, South Brisbane, AU

**Aim:** To assess and compare outcomes of twelve year old identical twins who sustained right anterior cruciate ligament ruptures within twenty-four hours of each other at the same sporting competition.

**Design:** Prospective case study.

**Method:** Two months following injury both twins underwent transphyseal anterior cruciate ligament reconstruction on the same day with the same surgeon, one with a double hamstring graft technique and the other with a single hamstring tape locking screw augmented graft. Both patients subsequently underwent rehabilitation with the same physiotherapist, attending appointments concurrently and performing similar post-operative rehabilitation programs.

Multiple radiographical, functional, and self-reported quality of life parameters were assessed post-operatively for up to two years to date.

Results: Both twins demonstrated no complications at follow-up and both had returned to competitive sport. Radiological findings for graft morphology and growth plate disturbance were unremarkable. Physical outcome measures of graft laxity, range of movement, balance, neuromuscular control, propulsion, hopping, two dimensional motion analysis, and agility tests will be reported on.

Conclusion: Differing surgical techniques and comparable physiotherapy rehabilitation on identical twins' knee joints resulted in similar radiological, functional, and quality of life outcomes.

Key Practice Points:

- The rate of paediatric ACL rupture is increasing and is a significant injury in the immature athlete.
- Surgical management and rehabilitation of anterior cruciate ligament injuries in the skeletally immature population differs to adults and best practice remains unclear.
- Further investigation into outcomes in this population is necessary to guide age specific treatment strategies.

## FROM LITTLE THINGS BIG THINGS GROW: DEVELOPMENT OF A PAEDIATRIC ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION REGISTRY

**Bradford K<sup>1</sup>**, Astori I<sup>1</sup>

<sup>1</sup>Department Of Orthopaedics, Queensland Children's Hospital, South Brisbane, Australia

Aim: To establish a paediatric anterior cruciate ligament registry to inform best practice in surgical reconstruction technique and subsequent physiotherapy management.

Design: prospective multi-centre clinical registry with minimum data set.

Method: A multidiscipline stakeholder group was convened to establish clinical, functional, and radiographic parameters related to anterior cruciate ligament reconstruction in the context of treatment outcomes. All patients presenting to one of two orthopaedic surgeons in Brisbane, Queensland and consenting for anterior cruciate ligament reconstruction were invited to enrol in the registry. Data is then collected by physiotherapists, surgeons, and radiologists pre-operatively, peri-operatively, six months post-operative, twelve months post-operative, and then annually.

Results: Twelve months of registry data will be presented with initial findings and trends expounded. In particular, outcome measures of knee laxity grade, growth disturbance, range of movement, balance, neuromuscular function, propulsion, hopping, two dimensional motion analysis, and agility tests will be reported on.

Conclusion: This registry is the first of its kind and has the capacity to expand into a multi-centre national and international collaboration. Physiotherapists have a key role in informing registry parameters and modifications, and contributing to data collection and interpretation.

Key Practice Points:

- This registry will provide crucial information on long-term outcomes in the skeletally immature patient.
- Physiotherapists are ideally placed to co-ordinate and contribute to clinical registries and interpret information for other health care professionals, administrators, and the wider community.
- Multiple research opportunities will emerge for physiotherapists to further investigate predictors of injury, rehabilitation guidelines, and return to sport recommendations.

## PATIENTS PRESENTING TO ED FOR CHRONIC PAIN: A MIXED METHODS STUDY OF FACTORS INFLUENCING THEIR ABILITY TO IMPLEMENT MANAGEMENT STRATEGIES

**Brady B<sup>1,2</sup>**, Andary T<sup>1</sup>, Boland R<sup>1,3</sup>, Jennings M<sup>1</sup>, Liamputtong P<sup>2</sup>, Dennis S<sup>1,3</sup>, Pavlovic N<sup>1</sup>, Zind M<sup>2</sup>, Tcharkhedian E<sup>1</sup>, Middleton P<sup>1,2,3</sup>, Parks J<sup>1</sup>, Chipchase L<sup>2</sup>

<sup>1</sup>South West Sydney Local Health District, Liverpool / Fairfield, Australia, <sup>2</sup>Western Sydney University, Campbelltown, Australia, <sup>3</sup>The University of Sydney, Lidcombe, Australia

**Aim:** To explore the unique challenges and experiences confronting culturally and linguistically diverse (CALD) and Australian-born patients attempting to implement physiotherapy recommendations to manage chronic pain.

**Design:** A mixed-methods study of patients with chronic pain.

**Method:** Forty-five adult CALD and 45 Australian-born patients presenting to Emergency Departments (ED) with chronic pain at two public hospitals were included. All underwent structured pain, health literacy, and physiotherapy assessments, and were provided with recommendations to manage their chronic pain conditions. Thirty-nine participants attended a semi-structured interview or focus group to explore their pain management experience. Patients were assessed 6 months later to evaluate the number of recommendations followed, explore barriers and enablers to implementing them, and effects on their pain experiences. Qualitative data were analysed using thematic analysis with resulting factors mapped onto the Capability, Opportunity, Motivation - Behaviour model.

**Results:** After 6-months, 82/90 patients were interviewed. CALD participants implemented 58% of recommendations, while Australian-born participants implemented 54%. Qualitative data revealed patient, provider and system level factors influenced whether recommendations were implemented across four themes: 1. degree of social connectedness; 2. reconciling the multiplicity of diagnoses and treatments; 3. reconceptualization of the self; 4. illness models.

**Conclusion:** Patients with chronic pain who attend ED have complex health profiles and challenges that constrain their ability to implement self-management strategies.

**Key Practice Points:**

- Successful implementation of physiotherapy recommendations is a product of patient, provider, and system factors.
- Physiotherapists require a greater appreciation of the personal, social, cultural and structural factors embedded in the pain experience.

## A RANDOMISED CONTROLLED EXPERIMENT TESTING PATIENT AND THERAPIST BLINDING: INNOVATIVE BLINDING STRATEGIES FOR PHYSICAL TREATMENTS

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<sup>1</sup>University of South Australia, Adelaide, Australia, <sup>2</sup>Flinders University, Adelaide, Australia

**Aim:** To determine whether a novel sham dry needling protocol could effectively blind patients and therapists to treatment allocation.

**Design:** Randomised controlled experiment.

**Method:** Qualified therapists (n=15) and asymptomatic patients (n=45) were randomly allocated to active and/or sham treatments. Therapists delivered eight treatments and patients received two treatments (forearms). Innovative cognitive and multisensory blinding strategies were used to enhance sham credibility. The primary outcome was guesses about treatment allocation, and successful blinding was pre-defined as <50% correct guesses (random chance). A secondary outcome was perceived sensations.

Results: Proportions of correct guesses were no different from 50% for patients (48.9%,  $p = 0.916$ ) or therapists (40.8%,  $p = 0.055$ ). There was no association between guesses and perceived sensations for patients.

Conclusions: Both patients and therapists were no better than chance at correctly identifying allocation; an unprecedented result that contests the widely held view that therapist blinding is impossible. A profound implication was that an indistinguishable tactile experience may not be crucial for patient blinding if differences are outweighed by effective cognitive and multisensory cues. Our findings should be a catalyst for a fundamental change in assumptions about how the efficacy of physical treatments can be tested.

Key Practice Points:

- Many pain treatments used by physiotherapists are difficult to sham because they involve physical interactions between patient and therapist.
- The mechanisms of many widely used physiotherapy treatments therefore remain unclear.
- This study provides empirical evidence that double-blinding is possible in physiotherapy trials and outlines innovative strategies to achieve blinding.

## DRY NEEDLING RESEARCH: IT MIGHT MAKE YOU TWITCHY

**Braithwaite F<sup>1,2</sup>**

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Meta-epidemiological evidence has demonstrated that estimates of treatment effects are at best exaggerated, or potentially artificially induced, when biases are not adequately controlled in clinical trials. This situation means that treatment effect estimates are uninterpretable, which has sparked growing acknowledgement of waste in clinical trial research due to significant economical and ethical implications.

The quality of clinical trials for dry needling is poor. Recent systematic reviews have reported that all dry needling trials have high or unclear risk of bias. Blinding is a key source of potential bias. Double-blinding has not been achieved, which is a major limitation of the evidence-base. Blinding is particularly critical for treatments that are likely to have large non-specific effects, such is the case for dry needling. Meta-analyses have shown that effect size estimates are biased by inadequate blinding procedures. Until robust trials with successful double-blinding are conducted and replicated, the specific effects of dry needling remain open to question.

Objectives: 1) To summarise the clinical trial evidence-base of dry needling and its limitations; 2) To provide guidance to clinicians on how to interpret the results of clinical trials in light of such limitations; 3) To discuss future directions for clinical trials.

Key Practice Points:

- Results of dry needling trials have been influenced by poor internal validity, namely inadequate blinding.
- The results of clinical trials should therefore be interpreted with caution.
- Well-blinded research is needed to clarify the mechanisms of dry needling.

## THE EFFECT OF A HIGH INTENSITY TREADMILL TRAINING AND SELF MANAGEMENT PROGRAM ON FREE-LIVING PHYSICAL ACTIVITY IN PEOPLE WITH STROKE UNDERGOING REHABILITATION

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Aim: To determine if a combined high intensity treadmill training and self-management program results in greater free-living physical activity and an improvement in underpinning factors than usual care after stroke.

Design: A prospective, two-arm, parallel group, multisite randomised trial with concealed allocation, and blinded measurement.



**Method:** 128 stroke survivors able to walk 10m undergoing inpatient rehabilitation participated. The experimental group completed high intensity treadmill gait training (30minutes, 3x/week for 8 weeks) across in and outpatients in combination with a self-management program. The control group completed usual gait training. Outcomes were measured at baseline (week 0), post intervention (week 8) and at follow-up (week 26). The primary outcome measure was physical activity (steps/day using activPAL3). Several secondary outcome measures of impairment, activity and participation were completed. An intention-to-treat approach with linear mixed models was used.

**Results:** Groups were not different at baseline and loss to follow up was low (9% week 8, 15% week 26). Experimental group participants attended 80% of sessions and increased their walking distance and self-management engagement across the sessions. The experimental group demonstrated a greater increase in steps post intervention than the control group (mean difference 1436 steps, 95%CI 229 to 2643), but was not sustained at 6-months. Few secondary outcome measures were different between groups.

**Key Practice Points:**

- A high-intensity treadmill training program embedded within a self-management approach during rehabilitation showed good compliance, increased step count, but there was a wide variation in activity levels.
- This program appears beneficial to some people after stroke.

## THE EFFECT OF PELVIC FLOOR MUSCLE INTERVENTIONS ON PELVIC FLOOR DYSFUNCTION AFTER GYNAECOLOGICAL CANCER TREATMENT: A SYSTEMATIC REVIEW

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**Aim:** To investigate the effect of non-surgical, non-pharmacological, pelvic floor interventions on pelvic floor dysfunction in women after gynaecological cancer treatment.

**Design:** Systematic review and meta-analysis.

**Method:** Six electronic databases were systematically searched in June 2018. Randomised controlled trials, cohort studies and case series were included if they investigated the effects of conservative pelvic floor interventions aimed at reducing pelvic floor dysfunction after gynaecological cancer treatment. Studies reporting pelvic floor symptoms, health-related quality-of-life, pelvic floor muscle structure or function, or vaginal, bladder or bowel complications were included.

**Results:** Five randomised controlled trials and three cohort studies with 905 participants were included. The results provided moderate evidence that pelvic floor muscle training with counselling and yoga or core exercises was beneficial for sexual function (SMD -0.96, 95% CI -1.22 to -0.70, I<sup>2</sup> =0%) and health-related quality-of-life (SMD 0.63, 95% CI 0.38-0.88, I<sup>2</sup> =0%) in cervical cancer survivors, and very low-level evidence that dilator therapy reduced vaginal complications in gynaecological cancer survivors (OR 0.37, 95% CI 0.17-0.80, I<sup>2</sup> =54%). There were insufficient data for meta-analysis of bladder or bowel function.

**Conclusion:** Conservative pelvic floor interventions may be beneficial for improving sexual function and health-related quality-of-life in gynaecological cancer survivors. Further high-quality studies are needed, especially to investigate the effect on bladder and bowel function.

**Key Practice Point:**

- Clinicians should consider offering pelvic floor muscle training and dilator therapy to women who present with pelvic floor dysfunction after gynaecological cancer treatment, based on individual patient presentation and patient preferences.



Registration: PROSPERO CRD42018097290.

## THE USE OF PHYSIOTHERAPY IN RESIDENTIAL AGED CARE FACILITIES INTERNATIONALLY: A SYSTEMATIC REVIEW

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**Aim:** Determine the type and scope of physiotherapy used by older adults in Residential Aged Care Facilities (RACFs).

**Design:** Systematic review (PROSPERO Reg: CRD42018082460).

**Method:** Searches were conducted across numerous databases, plus grey literature, following PRISMA-guidelines. Searches were limited to English-language publications from 1997-present. The Joanna Briggs Institute Appraisal Checklist for Analytical Cross-Sectional Studies was used by two reviewers independently to assess the quality of included studies.

**Results:** The use of physiotherapy by clients varied from 10-67% in the 11 included studies. Nursing home factors associated with greater use of physiotherapy included larger-size facilities, somatic units, and greater availability of physiotherapists. Self and staff-rated potential for improvement, a physical impairment, or no cognitive impairment were client-related factors associated with receiving physiotherapy. Average time spent using physiotherapy was 45-150 minutes per week. Two studies considered type of physiotherapy: one categorised physiotherapy as either pain management, non-pain management, or administration, and the other study focused on pressure ulcer treatment.

**Conclusion:** Physiotherapy service provision varies widely internationally. The majority of existing studies do not report sufficient detail to determine if current practice was appropriate, evidence-based or effective. Emerging evidence suggests physiotherapy services may not be equitably available or targeted at those with greatest needs.

### Key Practice Points:

- Physiotherapists should be encouraged and supported to monitor practice and undertake more research in aged care settings to facilitate evidence-based care for the ageing population.
- Avocation for greater access to allied health funding for aged care residents is needed to ensure effective and equitable care.

## RHEUMATOID ARTHRITIS AND THE PATH TO PARENTHOOD: OPPORTUNITIES FOR PHYSIOTHERAPISTS TO ADDRESS KEY INFORMATION GAPS

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**Aim:** To determine the pregnancy and post-natal information needs of women with rheumatoid arthritis (RA), identify effective educational programs for this group; and establish cross-discipline consensus on key messages and support that women with RA of reproductive age should receive from clinicians.

**Design:** Phased research program comprising a qualitative study, systematic review and e-Delphi study.

### Method:

1. Interviews and focus groups involving 27 women with RA who were pregnant or recently pregnant
2. Systematic literature review to identify interventions for improving pregnancy-related knowledge and/or self-management skills for people with RA
3. E-Delphi study involving a national 34-member expert panel (rheumatologists, obstetricians, pharmacists).

Results: Phase 1 found that women with RA strongly desired information about practical strategies for coping with daily challenges related to early parenting, and medication safety. Phase 2 identified only one study (of 68 studies evaluating RA educational interventions) that evaluated pregnancy-focused education, via a motherhood decision aid. Phase 3 established cross-discipline consensus on a range of clinical practices and information topics to optimise information provision and health service delivery for women with RA.

Conclusion: There is a clear need for appropriate RA-relevant education and support across the pregnancy and post-natal continuum. The development of clear consensus statements will support identified gaps in education and service delivery.

#### Key Practice Points:

- Physiotherapists are well-placed to provide disease-specific care along the perinatal continuum (from pre-pregnancy planning through to early parenthood).
- Practical strategies to support musculoskeletal health functional ability during pregnancy and the post-natal period are highly sought.

## DELIVERY OF HIGH-VALUE OSTEOARTHRITIS CARE REQUIRES REFORM FROM PRACTICE TO POLICY: OUTCOMES OF A MULTI-NATIONAL SURVEY OF CLINICIANS AND STUDENTS

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Aim: To explore the perspectives of clinicians and students on a continuum of factors related to delivery of high-value osteoarthritis care.

Design: Cross-sectional survey in Australia, New Zealand and Canada in 2017.

Methods: The survey tool included nominal- and free-text responses. At the clinical-level, we evaluated intrinsic factors (confidence in osteoarthritis knowledge/clinical skills and attitudes towards musculoskeletal pain and osteoarthritis care approaches) and extrinsic factors (evidence and patient-related factors). System and service-level factors were also evaluated.

Results: 1886 clinicians (1380 physiotherapists, 158 primary care nurses, 267 GPs, 81 GP registrars) and 1161 students (465 medical, 696 physiotherapy) responded. Confidence in osteoarthritis knowledge/skills was consistently greatest among physiotherapists and lowest among nurses; e.g. mean difference (95%CI) for physiotherapist-nurse analyses were 9.3(7.7-10.9) for knowledge (scale:11-55) and 14.6(12.3-17.0) for skills (scale: 16-80). Biomedical attitudes were stronger in nurses compared to physiotherapists (6.9(5.3-8.4); scale:10-60) and in medical compared to physiotherapy students (2.0(1.3-2.7)). Some clinicians and students agreed that people with osteoarthritis ultimately require total joint replacement (7-19% and 19-22%, respectively); that arthroscopy is appropriate for knee osteoarthritis (18-36% and 35-44%); and that MRI is informative for osteoarthritis care (8-61% and 21-52%). At the system-level, 48-70% of clinicians and 34-37% of students cited barriers to care, especially financing models and time pressures.

Conclusions: Reform initiatives across a continuum are required, with a particular focus on closing knowledge and skills gaps and reforming financing models.

#### Key Practice Points:

- Leadership roles for physiotherapists are warranted in osteoarthritis care.
- Optimising curricula will build capacity in workforce-ready graduates.

## USE OF THE COMMON-SENSE MODEL OF SELF-REGULATION TO EXPLORE BREATHLESSNESS BELIEFS AND EXPECTATIONS: SYSTEMATIC REVIEW

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**Aim:** To describe use of the common-sense model of self-regulation (CSM) in adults living with chronic conditions to explore breathlessness beliefs and expectations.

**Design:** Systematic review.

**Method:** Databases (MEDLINE, Scopus, Embase, Emcare, PsycINFO) were searched for primary studies reporting use of the CSM with adults living with chronic conditions commonly associated with breathlessness. Data on participant demographics, processes used to collect CSM data and CSM components commonly reported were independently extracted, collated and analysed descriptively.

**Results:** Of the 863 studies screened, 20 studies (n= 2,186 participants, sample range 7 to 394) across three chronic condition groups (respiratory n= 9, cardiovascular n= 9, renal n=2) were included. A single study specifically used the CSM to explore breathlessness. Validated instruments (n=13) such as the Brief Illness Perception Questionnaire and semi-structured interviews (n=13) were commonly used for data collection. The majority of studies reported information on six model components (timeline 85%, consequences 85%, control 80%, identity 75%, cause 65%, emotional illness representations 55%). Antecedents or stimuli underpinning breathlessness beliefs were rarely reported.

**Conclusion:** Beliefs and expectations are the foundation of symptoms such as breathlessness. The CSM has been widely used to study chronic conditions where breathlessness is common, but breathlessness is rarely the focus of this research.

#### Key Practice Points:

- Chronic breathlessness has not been well explored using the CSM.
- How breathlessness beliefs and expectations are formed and maintained in people with chronic breathlessness warrants further exploration.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research explored the use of the CSM in adults with chronic breathlessness. This review did not identify any studies that included Aboriginal or Torres Strait Islander people despite this population having a high chronic disease burden and specific health and cultural beliefs.

## SLEEP AND ITS RELEVANCE FOR HEALTH AND FUNCTION

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Sleep is a critical component of physical and psychological wellbeing. Disturbed sleep has been associated with impairment across a range of domains including mood, memory, physical activity and biological functioning (e.g., immunity). Sleep disturbance affects a large portion of the community and is particularly prevalent in individuals with complex health conditions, such as chronic pain. In fact, sleep disturbance and pain are two of the most commonly reported symptoms in individuals presenting for care in primary health settings. There are many reasons for this, ranging from altered biological/emotional regulation, through to pain-related behavioural responses which impede

sleep management. It is imperative that clinicians better understand the bidirectional relationship between sleep and pain in order to maximise the overall wellbeing of their clients. This session will be a clinically focussed discussion that explores the impact of sleep on health and function, with a particular focus on the chronic pain context. Strategies for assisting individuals to improve their sleep will also be discussed, including an accessible overview of sleep architecture and “normal” sleep patterns which can be used to underpin patient education.

## LIVE ON STAGE: BEHAVIOUR CHANGE CONSULTATIONS FOR PHYSICAL ACTIVITY PROMOTION

Burnett J, Dennett A, Hallett P

Physiotherapists are ideally situated to promote physical activity participation with their patients and the general community. It is widely recognised that educating people about physical activity is not enough to bring about lasting behaviour change. Instead, knowledge and skills in Behaviour Change Techniques (BCTs) are needed. The aim of this session is to provide live demonstrations of clinical consultations using a range of BCTs for promoting physical activity participation. Patients will be drawn from a range of settings from acute care to the community and will present with both acute and chronic conditions, limiting their capacity and motivation to be physically active. The three presenters are clinicians with significant experience and expertise in a range of BCTs. Demonstrations will include Motivational Interviewing, Cognitive Behavioural Therapy and pragmatic interventions which can be easily integrated into daily practice.

### Key Practice Points:

- Knowledge and skills in behaviour change techniques are needed to promote physical activity with patients.
- Clinical consultations using a range of behaviour change techniques will be performed live on stage, ensuring attendees are given an understanding of both the theory and practical application of these techniques.

## STOP AVOIDING DIFFICULT CONVERSATIONS – HOW TO DEAL EFFECTIVELY WITH CLIENTS

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Background: Client dissatisfaction with physiotherapy services can often be prevented by early identification and management of potential issues. Effective management of client dissatisfaction ensures that the concerns of individuals receiving physiotherapy treatment are taken seriously and are addressed promptly and fairly. In seeking early feedback from a client, the student/practitioner is better positioned to understand the client’s expectations and concerns, address those concerns and if necessary, change their practice.

Aims/objectives: To enable participants to instruct students/practitioners to respond appropriately and effectively to either perceptions of, or overtly expressed, client dissatisfaction.

Approach: Common reasons for client dissatisfaction will be outlined, followed by a demonstration of clinical practice examples. Participants will be presented with strategies of how to respond to and engage with a dissatisfied client. Participants will have an opportunity to ask questions and discuss the process. Handouts of the PowerPoints, a one page “How To” flow chart and a page “Tips” sheet will be provided.

### Key Practice Points:

Participants should be able to prepare students/practitioners to:

- Better understand why clients complain about their practitioner and the treatment they receive.
- Conduct a conversation with a dissatisfied client.
- Apply appropriate strategies for engaging effectively with a dissatisfied client.
- Recognise when to adjourn a conversation and how to re-engage with the client.

Proposed impact, if any on the health outcomes of Aboriginal and Torres Strait Islander peoples: The information from this presentation is likely to be more effective if incorporated into an appropriate cultural context when working with Aboriginal and Torres Strait Islander peoples.

## PELVIC FLOOR MUSCLE FUNCTION AND PELVIC ORGAN PROLAPSE IN NEPALI WOMEN

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**Aim:** Pelvic floor muscle function is associated with pelvic organ prolapse in Caucasian women however, variations have been documented between ethnic groups. This study aimed to determine if pelvic floor muscle strength and thickness are associated with prolapse in Nepali women.

**Design:** Cross-sectional study of women consecutively attending an outpatient clinic in Kathmandu, Nepal

**Method:** Non-pregnant Nepali women  $\geq 18$  years were included. The POP-Q system was performed to assess prolapse (stage 0-IV) and Modified Oxford Scale was performed to determine pelvic floor muscle strength (score 0-5). Puborectalis muscle thickness and hiatal area were assessed using 3D/4D translabial ultrasound. Statistical analyses included Pearson's correlation ( $p < 0.05$ ).

**Results:** Of the 123 women, more than half (65%) had POP-Q stage  $\geq II$ . Mean strength was 3.37 (SD 0.48) and puborectalis muscle thickness was 1.14 (SD 0.21) cm, hiatal area at rest was 14.67 (SD 3.11) cm<sup>2</sup> and contraction was 11.29 (SD 2.51) cm<sup>2</sup>. No associations were found between strength or thickness and POP-Q stages 0-IV. Hiatal area at rest and prolapse stage was positively associated ( $r = 0.339$ ,  $p < 0.001$ ), strength and hiatal area on contraction was negatively associated ( $r = -0.356$ ,  $p < 0.001$ ).

**Conclusion:** Contrary to previously reported data, pelvic floor muscle strength and thickness are not associated with prolapse in Nepali women. This confirms there may be differences in pelvic floor functional anatomy between ethnic groups.

### Key Practice Points:

- Mean muscle strength was good suggesting that connective tissue mobility may play a more important role in the aetiology of POP in this population.
- Conservative treatment strategies such as a pessary and lifestyle behavioural modifications may be suitable for Nepali women with a mild to moderate prolapse.
- Potential ethnic variations highlight that assessment and management of prolapse needs to be tailored.

## GRIT, RESILIENCE AND MINDSET-TYPE IN PHYSIOTHERAPY STUDENTS

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**Aim:** To determine levels of grit, resilience and mindset-type in physiotherapy students and explore relationships with demographic factors.

**Design:** A cross-sectional study utilising self-administered surveys.

**Method:** Final year physiotherapy students from one large University ( $n=160$ ) were invited to participate. Participants completed four valid and reliable questionnaires measuring grit, resilience and mindset-type. The results were summarised using descriptive statistics. Relative risk ratios and 95% confidence intervals were calculated to determine likelihood of being categorised as high or low grittiness, resilience or growth-mindset.

Results: Of the sample (n=134, completion rate 84%), 25% recorded low resilience levels, 19% low academic resilience, 13% low grit and 10% a fixed mindset-type. Students with a disability or mental health condition were two to three times more likely to have low resilience. Those working 15 or more hours/week in paid employment were almost three times more likely to have low academic resilience. Students with a mental health condition more likely to have low grit.

Conclusion: A proportion of physiotherapy students have low grit and/or resilience which may impact negatively on learning and students' ability to cope with placements. It is important to identify these students early to implement strategies to improve well-being and academic success.

Key Practice Points:

- Students with a disability, mental health condition and/or long paid working hours are more likely to have low grit and/or resilience.
- Early screening may assist pro-active implementation of strategies.
- Best practice approaches to support students with low grit and/or resilience need to be considered.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research may improve the wellbeing of Aboriginal and Torres Strait Islander physiotherapy students: Discuss physiotherapist-led initiatives to illustrate how clinical practice (what we do) can be changed by the implementation of research evidence (what we know).

## FITNESS ASSESSMENTS AS PREDICTORS OF PERFORMANCE IN POLICE OCCUPATIONAL TASKS

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Aim: To determine the ability of musculoskeletal fitness test scores in predicting performance in police occupational tasks.

Design: Retrospective cohort study

Methods: Retrospective data from 106 law enforcement officers who completed five fitness assessments (vertical jump (VJ), hand grip strength, leg back dynamometer, 1-minute push-ups and sit-ups) and three routine occupational tasks (1.22m fence jump (FJ), 8.5m victim drag (VD) with 102.3kg and get-up (GU)) were collected. A standard multiple regression was performed to determine if the results in fitness assessments were predictive of performance in the occupational tasks.

Results: Models combining all fitness assessments significantly predicted performance in FJ ( $F(5,88)=12.228$ ,  $p < 0.001$ ; adjusted  $R^2=0.61$ ), VD ( $F(5,88)=9.407$ ,  $p < 0.001$ ; adjusted  $R^2=0.45$ ) and GU ( $F(5,88)=14.319$ ,  $p < 0.001$ ; adjusted  $R^2=0.72$ ). Further analysis of individual predictors highlighted that performance in the VJ test was a significant contributor for all models, uniquely predicting 15% of FJ ( $p < 0.001$ ), 4% of VD ( $p = 0.03$ ) and 8% of GU ( $p = 0.001$ ). Grip strength uniquely contributed 3% to performance in the VD ( $p = 0.05$ ) and performance in the sit-up test contributed 8% to GU performance ( $p = 0.001$ ).

Conclusion: Performance in police-specific occupational tasks requires a combination of muscle power, strength and endurance. While power was integral to performance in all occupational tasks performed, attaining and maintaining all components of fitness is essential as they all contribute predicting performance in police officer occupational tasks.

Key Practice Points:

- Power and strength measures can predict performance in specific police occupational tasks.
- Musculoskeletal fitness is an essential part of return-to-work reconditioning programs for injured officers.



Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research will improve the health outcomes of Aboriginal and Torres Strait Islander people who serve in elite police forces.

## AEROBIC CONDITIONING IS IMPORTANT, BUT ANAEROBIC CONDITIONING IS CRUCIAL FOR POLICE OCCUPATIONAL TASK PERFORMANCE

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Aim: To determine the relationship between metabolic fitness test scores and performance in police occupational tasks.

Design: A retrospective cohort study.

Methods: Retrospective data from 106 law enforcement officers who completed two metabolic fitness assessments (anaerobic: a 20-meter (10-m and 20-m splits) sprint, aerobic: 20m-Multistage Fitness Test (MSFT)) and three routine occupational tasks (1.22m Fence jump (FJ), 8.5m Victim Drag (VD with 102.3kg) and 'Get-up'(GU)) were collected. A Kendall's Tau-b correlation coefficient was used to assess the relationship between the fitness tests and occupational tasks.

Results: There was a significant positive correlation between the 10-meter sprint scores and FJ ( $r=0.415$   $p<0.001$ ), VD ( $r=0.417$ ,  $p<0.001$ ) and GU ( $r=0.392$ ,  $p<0.001$ ). Similarly, the 20-meter sprint scores were significantly and strongly correlated with FJ ( $r=0.437$ ,  $p<0.001$ ), VD ( $r=0.450$ ,  $p<0.001$ ) and GU ( $r=0.419$ ,  $p<0.001$ ). These anaerobic tests predicted approximately 20% of the performance in the occupational tasks analysed. The MSFT fitness assessment had a weak, albeit significant negative correlation with the three tasks: FJ ( $r=-0.252$ ,  $p<0.001$ ), VD ( $r=-0.192$ ,  $p=0.007$ ) and GU ( $r=-0.305$ ,  $p<0.001$ ).

Conclusion: High levels of metabolic fitness correlated with faster performance in police officer occupational tasks, particularly ones of an anaerobic nature (i.e. the maximal sprint tests). In addition to typical aerobic fitness conditioning, anaerobic fitness conditioning could be vital for optimal performance in physically demanding tasks required of police officer.

Key Practice Points:

- Aerobic and anaerobic metabolic measures were correlated to performance in specific police occupational tasks.
- Return-to-work reconditioning for injured officers should include anaerobic training involving maximal sprint work.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research will improve the health outcomes of Aboriginal and Torres Strait Islander people who serve in elite police forces.

## EVIDENCE FOR PHYSIOTHERAPY IN THE MANAGEMENT OF PARKINSON'S DISEASE – ARE WE THERE YET?

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Parkinson' disease is now recognized as a complex, progressive, multi-system disorder associated with both motor and non-motor impairments. The evidence supporting physiotherapy interventions targeting balance and gait for people with Parkinson's disease is expanding at an exponential rate. But what does this evidence mean for clinical practice?

This talk will review recent high-quality studies and explore key themes across the disease spectrum, including (1) one size does not fit all; (2) does dose matter? (3) does physiotherapist expertise matter? (4) can virtual reality/exergames enhance outcomes?

## BEING A COMPETENT NEEDLER: LEARNING FROM OTHERS MISTAKE' AND TALK ABOUT THE IMPORTANT ASPECTS OF A GOOD NEEDLER

Cary D

Background: This presentation will combine the speaker's clinical and teaching experience, with ongoing involvement in the preparation of legal and regulatory briefs in regards to misadventures associated with dry needling and acupuncture practice.

Objective: For participants to understand the hallmarks of a competent and safe needler with regards to; examination, note taking, consent and staying within their scope of practice.

Key Practice Point:

- By examining relevant examples for each key area, participants will better understand and be able to apply knowledge learnt from past mistakes, to facilitate future practice in a safe and competent manner.

## DOES BREAKING UP PHYSIOTHERAPY TIME INTO SMALLER BLOCKS IMPROVE MOBILITY OUTCOMES AFTER ADMISSION TO REHABILITATION FOLLOWING HIP FRACTURE SURGERY?

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Aim: To investigate if three short sessions of physiotherapy were more effective than one long session each day in improving mobility in patients admitted to inpatient rehabilitation after hip fracture surgery.

Design: Randomised controlled trial

Method: 76 patients admitted to Peter James Centre were randomly assigned to either the intervention group or control group using computer generated concealed envelopes. The intervention group received three 15-minute sessions of physiotherapy five days per week. The control group received usual care of one 45-minute session of physiotherapy five days per week. The primary outcome was the De Morton Mobility Index (DEMMI) at admission, day 14 and discharge as measured by a blinded assessor. Secondary outcomes included length of stay, daily steps and Functional Independence Measure scores. Compliance with the program was recorded and intention to treat analysis was used.

Results: There were no significant differences between groups for the primary or any of the secondary outcomes. The mean difference in DEMMI at discharge between groups was -1.9 (95% CI -6.9 to 3.2). The average amount of physiotherapy per day was 18 minutes, which resulted in a significant change in the DEMMI in both groups.

Conclusion: Providing three short sessions of physiotherapy rehabilitation each day was not superior to one longer session for patients recovering from hip fracture.

Key Practice Points:

- It does not matter if patients spend a significant portion of their physiotherapy session resting.
- Service providers can be flexible in the way they deliver physiotherapy to patients after hip fracture surgery.



## ASSESSING NECK-SPECIFIC BODY-PERCEPTION IN PEOPLE WITH NECK PAIN: DEVELOPMENT AND EVALUATION OF THE FREMANTLE NECK AWARENESS QUESTIONNAIRE (FRENAQ)

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**Background:** Impairments of body-perception appear to be a consistent finding across several common pain conditions. Our recent work in Japanese samples suggests perceptual impairments are evident in people with neck pain too, where they relate to other measures of clinical status including pain intensity, disability, pain-related catastrophizing and fear of movement.

**Aim:** The aims of this study were to: (1) develop and evaluate an English version of the Japanese Fremantle Neck Awareness Questionnaire (FreNAQ-J) and (2) investigate the relationship between neck-specific body-perception and clinical status in English-speaking people with neck pain.

**Design:** Cross-sectional.

**Methods:** The FreNAQ-J was translated into English and data were collected from people with neck pain and age-matched healthy controls. Rasch analysis was used to evaluate differential test functioning, targeting, category order, unidimensionality, internal consistency, and differential items functioning in the neck pain population. Validity was investigated by comparison of FreNAQ-J data and clinical status.

**Results:** Preliminary findings (data collection continuing at time of abstract submission) suggest people with neck pain identify with the questionnaire items with greater frequency than healthy controls. Similar to the Japanese version of the questionnaire, the summed FreNAQ scores appear to be related with pain intensity, disability, pain-related catastrophizing and fear of movement.

**Discussion:** That people with neck pain appear to identify with the questionnaire items suggests perceptual impairment is a feature of the condition. The FreNAQ can thus be used to assess neck-specific body-perception that may be targeted in therapy.

**Key Practise Points:**

- Impairments of body-perception are common in chronic pain conditions.
- The Fremantle Neck Awareness Questionnaire provides a measure of neck-specific body-perception.
- Physiotherapists are well-placed to target impairments of body perception and that perceptual impairments relate to clinical status suggests they might be therapeutic targets.

## PROMOTING PHYSICAL ACTIVITY IN MELANOMA CANCER: THE EAT WELL, MOVE WELL WITH YOUR CANCER TREATMENT STUDY

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<sup>1</sup>Westmead Hospital, Westmead, Australia, <sup>2</sup>Crown Princess Mary Cancer Centre, Westmead, Australia

**Aim:** The aim of this study was to identify barriers and facilitators to participant ability to implement increased physical activity into their daily lives.

**Design:** Qualitative study situated within a phenomenological framework.

**Method:** Two focus groups were held with participants in an emerging cancer group, Melanoma patients undergoing targeted and immunotherapy treatments, at Westmead Hospital. Questionnaires about current activity were completed and a qualitative approach was undertaken to explore perceived barriers and facilitators to making lifestyle changes. Ethical approval was granted by the Human Research Ethics Committee, Westmead Hospital.

Results: Ten participants participated in the focus groups. Thematic analysis revealed barriers to physical activity included difficulty remaining motivated, breaking ingrained habits, and lack of community resources available. Facilitators, on the other hand, included individualised advice and having support from family, friends and health care professionals.

Conclusion: Despite acknowledging the barriers to making lifestyle changes, people with Melanoma highly value education, information and support to help increase physical activity levels. This information could be used to improve the uptake of exercise during cancer treatment.

Key Practice Points:

- Education about physical activity should be included as part of cancer rehabilitation
- Individually tailored advice and education is strongly appreciated
- Community support is required to help people with Melanoma make lifestyle changes

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The information from this presentation will be most useful if adapted into a cultural context when working with the Aboriginal and Torres Strait Islander population.

## WHERE TRADITIONAL CHINESE MEDICINE AND WESTERN CLINICAL REASONING INTERSECT - A JOURNEY OF A PHYSIOTHERAPIST INTO THE WORLD OF EASTERN MEDICINE

Chai T

A physiotherapist who found a lot of success using dry needling with his clients goes a step further and completes a Master's in Acupuncture. Hear him share some of what he learnt and how it has refined how he administers physiotherapy to his clients.

Key Practice Points

- Gain a better understanding of TCM principles and how they can be translated to Western Medicine.
- Re-think the role of dry needling in the physiotherapist's scope.

## NOVEL ASSESSMENTS IN ELITE ATHLETES WITH PERSISTENT POSTERIOR THIGH PAIN – EXPLORING POTENTIAL NON-TISSUE BASED CONTRIBUTORS TO PAIN

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Aim: To determine whether sensory, motor, and spatial processing abnormalities are present in elite athletes with persistent posterior thigh pain after hamstring injury.

Design: Cross-sectional study

Method: Fourteen male elite professional athletes with persistent posterior thigh pain and 14 pain-free controls matched for age, BMI, sporting discipline and level participated. Tactile acuity of the posterior thigh was assessed using two-point discrimination threshold and accuracy of tactile localisation; motor processing was assessed using left/right lower limb and upper limb judgment tasks; spatial processing was assessed using an auditory detection task.

Results: Two-point discrimination thresholds were similar for Athletes and Controls ( $p=0.70$ ). Athletes displayed leg-specific deficits in the other assessments: they were less accurate at localising tactile stimuli delivered to their affected leg, and at detecting auditory stimuli delivered near their affected leg, when compared to their healthy leg or to either leg of Controls ( $p<0.01$  for all). Athletes were also slower to make left/right judgments when the image corresponded to

their affected leg, than they were for their unaffected leg or either leg for Controls ( $p < 0.01$  for all). Performance on left/right upper limb judgements was similar for hands and groups ( $p = 0.90$ ).

**Conclusion:** Leg-specific tactile, motor, and spatial processing deficits appear to exist in elite professional athletes who report ongoing posterior thigh pain after hamstring injury. More research is needed to determine the role of these processing deficits in rehabilitation.

**Key Practice Points:**

- Athletes with persistent posterior thigh pain display injured-leg-specific tactile, motor, and spatial processing deficits.
- Addressing these processing deficits may supplement rehabilitation.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## **SIMULATION, STIMULATING ANXIETY: A PILOT RANDOMISED TRIAL**

Withington A<sup>1</sup>, Chalmers K<sup>1</sup>, Cavaleri R<sup>1</sup>, Blackstock F<sup>1</sup>

<sup>1</sup>Western Sydney University, Campbelltown, Australia

**Aim/objectives:** To examine the levels of perceived anxiety and physiological stress experienced during simulation-based education, and their association with performance of the learnt skill.

**Design:** Pilot randomised trial with allocation concealment and assessor blinded to group allocation.

**Methods:** Final-year entry-level physiotherapy students participated ( $n = 27$ ). Physiological stress-response and perceived anxiety were examined when students completed a simulation experience to learn the skill of airway suctioning. Students were randomly allocated to either a low, medium, or high complexity simulation scenario. Performance of the learnt skill was measured pre and post. Differences between groups were examined with a one-way ANOVA, and associations between perceived anxiety and performance determined with a Spearman's Rho.

**Results:** There were significant differences in perceived anxiety and physiological stress-response between the groups, with anxiety and stress increasing with scenario complexity ( $p < 0.001$ ). The low complexity group demonstrated significantly better performance of airway suctioning than the high complexity group (mean 16.30(95%CI 14.6-18.0) vs. 14.13(95%CI 12.7-15.5) respectively,  $F(1) = 4.807$ ,  $p = 0.043$ ). Higher perceived anxiety scores correlated with poorer performance of the skill ( $r = -0.441$ ,  $p = 0.021$ ). There was a moderate correlation between perceived anxiety and intra-simulation heart rate change ( $r = 0.425$ ,  $p = 0.027$ ).

**Conclusions:** Higher complexity of a simulation scenario increases perceived anxiety and physiological stress-response. Higher complexity of a simulation scenario also results in a poorer subsequent performance of the learnt skill.

**Key Practice Points:**

- Greater attention to the scenario complexity is needed when designing simulation-based education.
- Adjusting the complexity of simulation experiences for each student individually appears necessary to ensure optimal levels of stress for learning.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:**

Advancements in this area of research do not specifically impact Aboriginal and Torres Strait Islander people more than non-indigenous people.

## EVERYTHING I DO IT JUST ENDS UP WORSE: WOMEN'S EXPERIENCES IN THE DIAGNOSIS AND MANAGEMENT OF ENDOMETRIOSIS

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<sup>1</sup>Western Sydney University, Campbelltown, Australia, <sup>2</sup>Endeavour College of Natural Health, Sydney, Australia

**Aim:** To explore possible factors contributing to dissatisfaction with health and medical management in women with endometriosis, outside of poor treatment outcomes.

**Design:** Qualitative focus groups

**Method:** Twelve Australian women diagnosed with endometriosis participated in two face-to-face focus groups. Discussions were recorded and transcribed verbatim. Data were thematically analysed.

**Results:** The overarching theme that emerged was 'Everything I do it just ends up worse', where women felt as though every healthcare professional and treatment they sought was either unhelpful or made their symptoms worse. Three key sub-themes emerged: 'Dismissing my experience', where women felt their reports of symptoms were dismissed, not listened to, or not believed; 'It's all in your head', where women felt that their reports of pain were downplayed or blamed on their mental health; and 'Trial and error', where women described a plethora of unsuccessful treatments, being refused treatments, and seeing a myriad of healthcare professionals. Many women reported a healthcare system-wide distrust of health and medical professionals as a result of these factors.

**Conclusion:** Women with endometriosis face multiple barriers to receiving adequate treatment. Dismissing and normalising reported pain as well as multiple unsuccessful treatments leads to patient dissatisfaction and distrust. A positive interaction with health and medical professionals is imperative to building trust and improving the experience of women with endometriosis through their healthcare journey.

**Key Practice Points:**

- Further training for professionals in effective treatments, as well for improvement in soft skills, is imperative to improve the satisfaction levels of the management of symptoms in women with endometriosis.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## SYSTEMS AND STRATEGIES FOR IMPROVING ATHLETE AVAILABILITY AND HEALTH IN ELITE TRIATHLETES

Charlton P

This presentation will focus on the systematic implementation of an athlete availability system in elite triathlon. This includes an overview of the current landscape of health, injury and illness in an endurance, multisport event, strategies employed, early results and major challenges and barriers.

## IS STEP COUNT A GOOD INDICATOR OF SEDENTARY BEHAVIOUR IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE?

**Cheng S<sup>1</sup>**, Alison J<sup>1,2</sup>, Stamatakis E<sup>3</sup>, Dennis S<sup>1,4</sup>, McKeough Z<sup>1</sup>

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**Aim:** To determine whether step count is an indicator of sedentary behaviour in people with chronic obstructive pulmonary disease (COPD) compared to objectively-measured sedentary time.

**Design:** Cross-sectional study of people with COPD recruited from the waiting lists of five pulmonary rehabilitation programs in metropolitan Sydney.

**Methods:** Daily step count and sedentary time were measured using a thigh-worn activPAL3 micro tri-axial accelerometer/inclinometer (PAL Technologies, Scotland) for seven days, 24 hours/day. The surrogate measure of 'sedentary' was a step count of <5000 steps/day, and 'non-sedentary' ≥7500 steps/day. The 'true' measure of 'sedentary' was a sedentary time of ≥70% of total waking wear time, and 'non-sedentary' <70% of total waking wear time. Sensitivity, specificity and accuracy of the surrogate sedentary behaviour measures were calculated using a confusion matrix and ROC analysis.

**Results:** 70 people with COPD (mean (SD) age 74 (9) years, mean FEV1 56 (19) % predicted, 49% male) had at least four days of valid wear data. Of 44 participants with <5000 steps/day, 80% were correctly identified as 'sedentary', resulting in a sensitivity of 0.80, a specificity of 0.73, and an accuracy of 0.77. Of 11 participants with ≥7500 steps/day, 73% were correctly identified as 'non-sedentary', resulting in a sensitivity of 0.73, a specificity of 0.66, and an accuracy of 0.67.

**Conclusion:** Step count may be a reasonable indicator of sedentary behaviour in people with COPD.

**Key Practice Points:**

- In the absence of objectively-measured sedentary time, step count may be used to screen for 'sedentary' individuals with COPD.

## VALIDATION OF THE SEDENTARY BEHAVIOUR QUESTIONNAIRE IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

**Cheng S<sup>1</sup>**, Alison J<sup>1,2</sup>, Stamatakis E<sup>3</sup>, Dennis S<sup>1,4</sup>, McKeough Z<sup>1</sup>

<sup>1</sup>Discipline of Physiotherapy, The University of Sydney, Sydney, Australia, <sup>2</sup>Allied Health Professorial Unit, Sydney Local Health District, Sydney, Australia, <sup>3</sup>School of Public Health, The University of Sydney, Sydney, Australia, <sup>4</sup>Ingham Institute for Applied Medical Research, Sydney, Australia

**Aim:** To validate total sedentary time measured by the Sedentary Behaviour Questionnaire (SBQ) in people with chronic obstructive pulmonary disease (COPD) against a gold standard activity monitor.

**Design:** Cross-sectional study of people with COPD recruited from the waiting lists of five pulmonary rehabilitation programs in metropolitan Sydney.

**Methods:** Total sedentary time measured by the SBQ was compared against sedentary time measured by a thigh-worn activPAL3 micro tri-axial accelerometer/inclinometer (PAL Technologies, Scotland) using Bland-Altman analysis to assess agreement, and Pearson correlation to assess criterion validity. Paired t-tests were used to calculate the mean difference in sedentary time between the SBQ and the activPAL monitor (used to gauge accuracy), and the standard deviation of the difference (used to gauge precision).

**Results:** 70 people with COPD (mean (SD) age 74 (9) years, mean FEV1 56 (19) % predicted, 49% male) had at least four days of valid wear data. A weak correlation was observed between self-reported and objective sedentary time ( $r=0.27$ ).

The SBQ underreported total daily sedentary time by 1.9 hours (95% CI -2.7 to -1.1), with wide limits of agreement (upper and lower limits of agreement 4.96 and -8.76) and poor precision (>3.5 hours) compared to objectively-measured sedentary time.

Conclusion: Total sedentary time measured by the SBQ showed low correlation, low accuracy and poor precision compared against objectively-measured sedentary time in people with COPD.

Key Practice Points:

- In COPD, the SBQ may be useful for providing information about time spent in specific sedentary behaviours rather than for measuring total sedentary time.

## ASSOCIATIONS OF SEDENTARY BEHAVIOUR WITH CLINICAL OUTCOMES IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

**Cheng S<sup>1</sup>**, Alison J<sup>1,2</sup>, Stamatakis E<sup>3</sup>, Dennis S<sup>1,4</sup>, McKeough Z<sup>1</sup>

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Aim: To examine the associations between sedentary behaviour and clinical outcomes in people with chronic obstructive pulmonary disease (COPD).

Design: Cross-sectional study of people with COPD recruited from the waiting lists of five pulmonary rehabilitation programs in metropolitan Sydney.

Methods: Sedentary time and physical activity were measured using a thigh-worn activPAL3 micro tri-axial accelerometer/inclinometer (PAL Technologies, Scotland). If sedentary time was  $\geq 70\%$  of total waking wear time, participants were considered to be 'sedentary'. Exercise capacity was measured using the six-minute walk test; health-related quality of life (HRQoL) using the St George Respiratory Questionnaire; patient activation using the Patient Activation Measure; and anxiety and depression using the Hospital Anxiety and Depression Scale. Pearson correlations were conducted between sedentary time and each clinical outcome.

Results: 70 people with COPD (mean (SD) age 74 (9) years, mean FEV1 56 (19) % predicted, 49% male) had at least four days of valid wear data, of which 61% were identified as 'sedentary'. Sedentary time (represented as a percentage of total waking wear time) was strongly associated with time spent in light-intensity physical activity ( $r=-0.95$ ); moderately associated with step count ( $r=-0.60$ ) and time spent in moderate-vigorous intensity physical activity ( $r=-0.58$ ); and weakly associated with six-minute walk distance ( $r=-0.35$ ). No associations were demonstrated for lung function, HRQoL, patient activation, anxiety or depression.

Conclusion: Sedentary behaviour was associated with physical activity and exercise capacity in people with COPD.

Key Practice Points:

- Sedentary behaviour should be measured in COPD as part of routine clinical practice.

## DOES UPPER LIMB USE DIFFER AMONG PEOPLE WITH DIFFERENT UPPER LIMB IMPAIRMENT LEVELS EARLY POST-STROKE?

**Chin L<sup>1,2,6</sup>**, Hayward K<sup>2,3,4,5</sup>, Brauer S<sup>2</sup>

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**Aim:** To characterize paretic upper limb use in people with different levels of upper limb impairment early after stroke during and outside therapy.

**Design:** A prospective cohort study in a subacute rehabilitation hospital.

**Method:** Sixty inpatients with first-time stroke  $\leq 4$ -weeks ago ( $n=60$ ,  $62 \pm 12$  years) were recruited. Participants were categorized by Fugl Meyer Upper Limb score into mild(51-66), moderate(23-50) and severe(0-22) subgroups. All wore bilateral wrist accelerometers measuring UL use over 24hours. Main outcome measures were duration of paretic upper limb use and ratio of paretic/non-paretic UL use.

**Results:** Sixty-three percent of stroke participants with mild impairment used their paretic upper limb  $>6$  hours/day (median(IQR): 6.7(3.3); use ratio 0.9 (0.3)). Those with moderate impairment demonstrated wide variation of use with 13.3% achieving  $>6$  hours/day (median(IQR): 4.5(3.8); use ratio 0.5(0.2)). People with severe impairment demonstrated limited use with none achieving  $>6$  hours/day of use (median(IQR): 1.7(0.7); use ratio 0.3(0.2)). Paretic upper limb use and use ratio were greater during therapy sessions compared to outside therapy in moderate and severe groups ( $p < 0.002$ ).

**Conclusions:** Patterns of upper limb use differed by severity of impairment. Moderate and severe groups used their paretic upper limb more during therapy, inferring that it is possible to increase paretic use despite motor impairment.

**Key Practice Points:**

- Develop strategies to increase upper limb use according to impairment level.
- Efforts should be directed to increase upper limb use outside therapy for those with moderate and severe upper limb impairment to impact recovery early post-stroke.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research provides information to improve post-stroke practice. It is not specific for Aboriginal and Torres Strait Islander people, hence impact on the health outcomes of this population might not be expected.

## FACTORS INFLUENCING UPPER LIMB USE EARLY POST-STROKE

**Chin L<sup>1,2,6</sup>**, Hayward K<sup>2,3,4,5</sup>, Kong K<sup>1</sup>, Chai A<sup>1</sup>, Brauer S<sup>2</sup>

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**Aim:** To investigate factors related to paretic upper limb use early post-stroke.

**Design:** Prospective cohort study in a subacute rehabilitation hospital.

**Method:** Sixty inpatients within 4-weeks of first-time stroke were recruited. Participants were stratified by severity as defined by Fugl Meyer Upper Limb score: severe=0-22, moderate=23-50, mild=51-66. All wore a wrist accelerometer on the paretic upper limb (24hours). The dependent factor was duration of paretic UL use. Factors investigated were measures of: upper limb motor capability (e.g., Fugl Meyer Upper Limb score); mobility (e.g., step count); balance;



functional independence; sensory impairment; shoulder pain; cognitive function; social factors; environmental restriction and knowledge. Individual and multivariate quantile regression analysis were performed.

Results: Many factors including upper limb motor capability, mobility, balance, functional independence, self-efficacy and knowing how to exercise and use the paretic upper limb were significantly related to upper limb use across the three severity groups ( $R^2 = 0.079\text{--}0.492$ ,  $p < 0.02$ ). Results of multivariate regression showed that the only significant factor in severe group was Fugl Meyer Upper Limb score ( $R^2 = 0.48$ ,  $p < 0.005$ ). For moderate and mild groups, both Fugl Meyer Upper Limb score and step count were significant (moderate  $R^2 = 0.55$ ; mild  $R^2 = 0.54$ ;  $p < 0.04$ ).

Conclusions: During early post-stroke, upper limb motor capability is associated with paretic upper limb use for people across three severity groups. Step count is associated with paretic upper limb use in the moderate and mild groups.

#### Key Practice Points:

- Improve upper limb motor capability and mobility to increase paretic upper limb use to facilitate recovery early post-stroke.

Proposed impact, if any, on health outcomes of Aboriginal and Torres Strait Islander people: This research provides information to understand factors contributing to arm use during early post-stroke in Singapore. Factors influencing arm use may vary with cultural background, thus may not be applicable to Aboriginal/ Torres Strait Islander people.

## EXPLORING THE EFFECT OF ACUPUNCTURE ON THE PAIN INHIBITION SYSTEM VIA CONDITIONED PAIN MODULATION (CPM) PARADIGM IN HEALTHY CONTROLS: A SUB-STUDY OF THE ACUENDO TRIAL

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Background: The perception of pain is reduced when another spontaneous painful stimulus is applied to a remote body part. This phenomenon is called Conditioned Pain Modulation (CPM). The underlying mechanisms may involve multiple inhibitory and excitability pathways in pain processing. Acupuncture provides analgesia via modulation of neural networks comprising the brainstem, hypothalamus, amygdala, peri-aqueductal gray, cingulates, insula, limbic and paralimbic structures which subsequently elicits descending pain control systems. Preliminary evidence showed acupuncture reduces endometriosis related chronic pelvic pain (CPP), however studies investigating the effect of acupuncture on pain processing pathways in healthy women using the CPM paradigm is scarce.

Objective: The main objective of this study is to investigate if a single session of acupuncture using acupuncture points for endometriosis related CPP alters CPM response in healthy women.

Method: This was a single session pre and post acupuncture intervention, repeated measure study. Nineteen healthy female participants were recruited.

Step1: Three trials of pressure pain threshold (PPT) as test stimulation were measured by a digital algometer on ventral side of the dominate forearm as baseline. PPT measurements were repeated whilst the participants immersed their non-dominant hand in a 3°C cold bath (cold pain stimulus) for a duration of one minute.

Step 2: Participants were in supine and a 25 to 30-minute session of acupuncture was administered.

Step 3: Immediately following acupuncture, PPT measurements were repeated as in Step 1.

The magnitude of CPM response was measured as the difference between the average of the three PPT values during cold bath immersion and the average of the three PPT values prior to cold bath immersion.

Results: The PPT values measured were in normal distribution. The magnitude of CPM response pre and post acupuncture were 2.72 and -1.39 respectively. Paired sample t-test showed there was no significant change between the



magnitude of CPM responses after acupuncture ( $t_{18}=1.927$ ,  $p=0.07$ , 95% CI  $-0.378$  to  $8.79$ ). However, PPT with cold bath immersion was significantly reduced immediately after acupuncture ( $t_{18}=2.552$ ,  $p=0.02$ , 95% CI  $0.98$  to  $10.16$ ).

Conclusion: The baseline CPM response was small which may indicate poor CPM functioning in this cohort of participants. Acupuncture did not influence CPM response. Pressure pain threshold of participants, when subjected to cold stimulation, was significantly reduced by acupuncture.

## WHICH INTERVENTIONS FOR MANAGING OSTEOARTHRITIS DO STAKEHOLDERS WANT?

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Aim: To prioritize knee osteoarthritis interventions based on preference and intervention performance criteria.

Design: Multi-criteria decision analysis among cross-sectoral New Zealanders.

Method: Preference weights of eight criteria used to choose osteoarthritis interventions, representing the criteria's relative importance, were obtained from a choice-based survey ( $N=178$ ; 63% female; [mean age $\pm$ SD]  $54\pm13$ ) completed by consumers ( $n=58$ ), Māori health advocates ( $n=5$ ), healthcare providers ( $n=79$ ), policy-makers ( $n=24$ ) and osteoarthritis experts ( $n=12$ ). Interventions from Australian osteoarthritis clinical practice guidelines were rated on the criteria and their associated weights summed to produce a ranking of the interventions.

Results: The criteria in decreasing order of importance (weights in parentheses) are: 'recommendation' (19.0%), 'quality of evidence' (17.6%), 'effectiveness' (15.0%), 'duration' (13.2%), 'risk of serious harm' (12.8%), 'risk of mild harm' (9.4%), 'cost' (6.6%) and 'accessibility' (6.3%). Considering only the 15 guideline-recommended interventions, 'all land-based exercise' (intervention score=74.2%), 'topical NSAIDs' (76.7%), and 'total knee replacement' (74.3%) ranked 1st for early-, mid- and advanced-stage osteoarthritis, respectively. At any stage of osteoarthritis 'aquatic exercise' (range=70.5%-70.5%), 'manual therapy' (68.9%-73.1%), 'duloxetine' (67.9%-72.1%) and 'walking cane' (64.7%-68.9%) ranked  $\leq 6$ th; the difference between 1st and 6th ranked intervention scores is  $\leq 7.8\%$ . Core interventions 'weight management' and 'self-management and education' ranked 12th-14th (50.5%-56.0%).

Conclusion: Not all core interventions are desirable at any stage of osteoarthritis and the difference between preferred interventions is small.

### Key Practice Points:

- Patients' adherence to core interventions 'weight management' and 'self-management' may be low due to them being less desirable than other recommended interventions.
- Some physiotherapy-led recommended adjunct interventions are highly desirable.

## BE INSPIRED BY PHYSIOTHERAPISTS WHO HAVE JUGGLED, JOURNEYED AND STRIVEN TO TRANSFORM THEIR CAREERS

Chung A, Connaughton J, Mulcahy A, Zorzi L

Like any professional, physiotherapists experience highs and lows in their careers. We all experience frustrations and disappointments, but also successes and achievements. Hurdles come along the way of our careers: you may have to juggle work and family responsibilities, maybe you experience a feeling of being stuck in your role, or perhaps you have to overcome the difficulties of working in a new or multiple roles. We are often told to be resilient, believe in ourselves, and work with our own strengths and weaknesses, however we have to experience successes and failures to actually understand these concepts. In this inspirational session, speakers with widely varying career paths will openly and honestly discuss the hurdles they faced along the way of their professional careers. They are ordinary physiotherapists who have experienced challenges like any of us. The speakers have not arrived at their current destination by having

opportunities handed to them on a plate; instead, they have been able to turn challenges into success stories and achievements. In order to do so, they have juggled, journeyed, and striven, moving out of their comfort zone and taking risks - with mixed results. These inspirational physiotherapists will talk about their journey, discuss how they approached and managed successes, but also how disappointments shaped their careers. This session will inspire you to move forward in your career and take on challenges and opportunities as they emerge along the way.

**Key Practice Points:**

- All physiotherapists experience disappointments and successes in their careers.
- Opportunities are often not handed on a plate; instead, we may have to step out of our comfort zones.
- By being resilient and working with our strengths, we can take on challenges and opportunities to transform our careers.

## LSVT-BIG VERSUS USUAL CARE PHYSIOTHERAPY FOR PEOPLE WITH PARKINSON'S DISEASE: A RETROSPECTIVE SERVICE EVALUATION OF MOTOR AND FUNCTIONAL OUTCOMES

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**Aim:** This clinical audit aimed to evaluate outcomes of balance, gait and function in a day program physiotherapy service before and after implementing LSVT-BIG compared with usual care.

**Design:** Retrospective clinical audit.

**Methods:** Patients who attended one-to-one Day-Program physiotherapy to manage Parkinson's disease, between 2015 - 2018 were eligible for study inclusion. Patient demographical and functional performance data was collected including Six Minute Walk Test, Timed Up and Go Test, Ten Metre Walk Test, Berg Balance Score, and Australian Modified Lawton's Instrumental Activities of Daily Living Assessment. Length of program (days) and frequency per week of therapy received was also collected. The mean change from pre- to post-intervention scores were compared between patients who received LSVT-BIG (n = 19), LSVT-MOD (n = 11) and usual care (n = 14), using mixed model ANOVA and post-hoc comparisons. Clinical relevance was determined by  $p < 0.05$ .

**Results:** On average, LSVT-BIG participants were 10 years younger ( $p = 0.007$ ). Despite differences in length of program ( $p = 0.000$ ) and doubled frequency of therapy received per week ( $p < 0.001$ ) received between LSVT-BIG and the other two groups, there were no significant between-group differences in any of the functional outcome measures.

**Conclusion:** LSVT-BIG was not more effective in improving functional performance than usual care physiotherapy or LSVT-MOD, delivered in half the amount of sessions.

**Key Practice Points:**

- It is unsure whether LSVT-BIG, although delivered with twice the frequency of the usual care Parkinson's Disease Day-Program, is associated with increased functional outcomes.

## SPORTS STARS: A practitioner-led, group-based sports intervention in the community improves sports activity capacity in ambulant children with cerebral palsy

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**Aim:** To compare the effectiveness of "Sports Stars", an eight-week, physiotherapist-led introduction to sports group, to standard care in improving sports activity capacity in ambulant, school-aged children with cerebral palsy.

**Design:** Randomised, waitlist-controlled, assessor blinded, superiority trial.

**Method:** Fifty-four children were recruited through a state-wide CP service and register. Geographical groups of 4-6 participants were randomised into immediate or waitlist groups. Sports activity capacity outcomes (gross motor function, postural control and fitness) were measured before, immediately after, and 12 weeks after immediate intervention. Analysis used linear mixed models.

**Results:** Participants of Sports Stars demonstrated improved high-level gross motor performance (GMFM-Challenge: 11 points,  $p=0.038$ , Test of Gross Motor Development-2: 16 points,  $p=0.002$ ). Children showed a trend towards improved postural control on the Timed Up and Go (-0.61 seconds,  $p=0.054$ ) and appeared to show greater improvements than the control group in agility (10x5m Sprint Test: -4.203s), anaerobic fitness (Muscle Power Sprint Test, -1.244sec), functional lower limb strength (Vertical Jump, 2.368cm, Broad Jump, 11.155cm) and functional upper limb strength (Seated Throw, 27.521cm) however these did not reach statistical significance ( $p=0.192-0.792$ ).

**Conclusion:** Sports Stars was effective in improving high-level gross motor skills in ambulant, school-aged children with CP. Further investigation is required to investigate the short and long term effects of Sports Stars on fitness and postural control.

**Key Practice Points:**

For ambulant children with cerebral palsy, physiotherapist-led, community sports groups such as Sports Stars;

- are safe, effective and enjoyable,
- improve gross motor performance, and
- may improve postural control and fitness

## **SPORTS STARS: PARENTS AND PHYSIOTHERAPISTS PREFER PRACTITIONER-LED SPORTS GROUPS FOR AMBULANT, SCHOOL-AGED CHILDREN WITH CEREBRAL PALSY WITH SPORTS FOCUSED GOALS**

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**Aim:** To investigate perspectives of parents and treating physiotherapists on the effectiveness of “Sports Stars”, an eight-week, physiotherapist-led introductory sports group.

**Design:** Randomised, waitlist-controlled, assessor blinded, superiority trial with post-intervention parent and physiotherapist survey.

**Method:** Fifty-four children were recruited through a state-wide CP service and register and randomised into immediate or waitlist groups of 4-6 participants by location. Sport-specific activity and participation goals were scored on the Canadian Occupational Performance Measure before, immediately after, and 12 weeks after the immediate intervention. Perspectives of parents and treating therapists were then collected via an online survey. Analysis was undertaken using linear mixed models.

**Results:** Children in the Sports Stars group improved >3 points in performance and satisfaction on their sports activity and participation goals ( $p<0.001$ ) on the COPM. Parents and physiotherapists reported improvements across physical, social, cognitive and psychological skills. These outcomes were not reflected in more general measures (CP-QoL:  $p=0.757-0.979$ , CAPE-PAC:  $p=0.604-0.989$ ). All treating therapists and 92.59% of parents reported that a community-based group intervention would be preferred to individual therapy for children with sports-focused goals.

**Conclusion:** Community sports groups are the preferred method for improving individual sports-focused goals for ambulant children with cerebral palsy.

#### Key Practice Points:

For ambulant children with cerebral palsy, physiotherapist-led, community sports groups such as Sports Stars;

- are effective in improving individual, specific, sports-focussed goals,
- provide opportunities to improve physical, social, cognitive and psychological skills required for sport, and
- are the physiotherapy intervention preferred by parents and physiotherapists for sports-focussed goals.

### DOES DYNAMIC HIP TAPE® CHANGE KNEE VALGUS DURING RUNNING IN HEALTHY FEMALES?

Sharifi Nasab K<sup>1</sup>, Coates S<sup>1</sup>, Moresi M<sup>1</sup>

<sup>1</sup>Australian Catholic University, Sydney, Australia

**Aim:** To determine if the application of an elastic hip external rotation technique using Dynamic Tape® (DT) will reduce dynamic knee valgus during running in healthy females compared to no tape and sham tape (ST).

**Design:** Randomised cross-over design

**Method:** 20 healthy female runners ran for three minute periods on a treadmill at a self-selected pace under each condition: no tape, DT and ST. Knee kinematic data was collected using a 10-camera 3D motion analysis system. A repeated measures ANOVA was performed to determine statistically significant differences ( $p < 0.05$ ) in peak angle and velocity of knee abduction and internal rotation during stance phase.

**Results:** DT reduced peak knee abduction ( $p = 0.018$ ) and internal rotation ( $p = 0.019$ ) range compared to no tape. DT also reduced rate of both knee abduction ( $p = 0.011$ ) and internal rotation ( $p = 0.006$ ) compared to no tape. No significant differences were found between ST and no tape, nor ST and DT conditions for any variable.

**Conclusion:** Dynamic® hip external rotation tape reduces magnitude and rate of dynamic knee valgus during treadmill running in healthy females. Clinical use of DT for knee motion control is advocated based on the findings of this study. Further research on larger clinical populations is warranted.

#### Key Practice Points:

- Clinical use of DT for control of dynamic knee valgus during a weightbearing functional task is advocated based on the findings of this study and may have important implications for reducing lower limb injuries including patellofemoral pain and anterior cruciate ligament injuries in at risk populations.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research aims to explore the mechanism of action behind taping. Any benefits may not directly improve health outcomes for Aboriginal and Torres Strait Islander people compared to non-Indigenous populations.

### OCULOMOTOR, VESTIBULAR AND CERVICAL SCREENING IN ELITE CRICKETERS

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**Aim:** To investigate whether potential risk factors for injury or impaired performance (oculomotor, vestibular or cervical deficits) are present in elite cricketers.

**Design:** Cross-sectional study conducted at the team's training facility.

**Method:** Elite cricketers from women's ( $n=13$ ), senior men's ( $n=19$ ) and under-19 men's ( $n=7$ ) teams were assessed pre-season using: the Vestibular Ocular Motor Screen (VOMS), optokinetic stimulation (OKS), the modified balance error scoring system and cervical joint position error (JPE), range of motion and manual palpation.

Results: At baseline 4 players had positive VOMS scores, 16 (41%) scored greater than the norm of 5cm for near point convergence, and 16 (41%) had JPE greater than the norm 4.5cm. Three players had positive OKS, and this correlated with suffering a head knock later during the season ( $p = 0.32$ ,  $p = 0.04$ ).

Conclusions: Pre-season screening can identify oculomotor, vestibular and cervical deficits in elite cricketers. The prevalence of convergence insufficiency and poor cervical proprioception (JPE) is high in elite cricketers. These deficits can be treated and may decrease a player's risk of concussion or other injury and or enhance performance.

Key Practice Points:

- Previous research has identified oculomotor and cervical deficits as risk factors for concussion. Identifying players with deficits pre-season may identify those at heightened risk of concussion.
- Management directed towards these oculomotor, vestibular or cervical deficits may prevent injury or enhance sporting performance.
- Pre-season screening provides baseline data that can be used for 'return to play' decisions if a player suffers a concussion during the season.

Proposed impact for indigenous people:

Australia has a large indigenous sporting population. Better identification of injury risk factors and deficits may allow them to be treated and decrease a player's risk of concussion and or enhance performance.

## INTRINSIC FOOT MUSCLE EMG ACTIVITY IS ALTERED WHEN WALKING WITH FOOT ORTHOSES

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Aim: Determine the immediate effects of foot orthoses on patterns of EMG activity of the intrinsic foot muscles during walking.

Design: Immediate effects, within-subject laboratory study.

Method: 7 pain-free individuals walked on a treadmill at a standardised speed (4km/h) under two footwear conditions: (i) shoes alone; and (ii) shoes with prefabricated foot orthoses.

Outcome measures: Intramuscular EMG was recorded from three intrinsic foot muscles (adductor hallucis [AddH], first dorsal interosseous [FDI], abductor hallucis [AbdH]) and three extrinsic foot muscles (tibialis posterior [TP], flexor digitorum longus [FDL], peroneus longus [PL]). Individual muscle EMG patterns were compared between conditions using wavelet-based mixed effects models.

Results: When walking with foot orthoses, reduced EMG activity was observed in AddH and AbdH around heel strike, and in AddH and FDI at toe off. AbdH activity was reduced during resupination, then increased at toe off. Small increases in TP activity were observed after heel strike and toe off, while PL activity was reduced after foot flat.

Conclusion: Immediate neuromuscular adaptations when walking with foot orthoses appear to reduce neural drive to the deep intrinsic forefoot muscles (AddH, FDI), particularly during key periods of the gait cycle where they typically demonstrate peaks of activity. This may affect their capacity to contribute to forefoot stiffness and aid propulsion in terminal stance.

Key Practice Points:

- When prescribing foot orthoses for lower limb pain and injury, physiotherapists should consider potential effects on intrinsic foot muscle activity, and the need to supplement foot orthoses intervention with intrinsic foot muscle exercises.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## ADDRESSING MENTAL HEALTH LITERACY OF PHYSIOTHERAPY STUDENTS

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**Aim:** To determine if Mental Health First Aid (MHFA) training impacts on physiotherapy students' attitudes toward Mental Health (MH) and their confidence to engage with people with comorbid MH problems.

**Design:** Data were collected using an anonymous survey including the Attitudes Towards Psychiatry-30 (ATP-30), questions on perceived confidence to engage people with MH problems and open-ended questions on the impact of MHFA training.

**Method:** Following MHFA training, final year physiotherapy students (MHFA Group, n=35) completed the survey. Scores were compared to a previous study of students who had not completed training (Non-MHFA Group) using independent t-tests ( $\alpha = 0.05$ ). Changes in confidence were analysed using paired t-tests ( $\alpha = 0.05$ ). Ethical approval was granted.

**Results:** Attitudes toward MH were significantly improved following MHFA training: Non-MHFA Group (mean=107.83; SD9.31); MHFA Group (mean=114.71; SD10.86;  $t(87)=-3.16$ ,  $p<0.05$ , two tailed). A statistically significant increase in perceived confidence to engage with people with MH problems was noted after MHFA training: Pre-MHFA (M=1.86, SD.88), post-MHFA (M=2.97, SD=.57),  $t(35)=-9.18$ ,  $p<0.05$  two tailed).

MHFA training improved communication skills and knowledge of signs and symptoms.

**Conclusion:** MHFA training improves physiotherapy students' MH literacy and attitudes towards MH and increases confidence to engage with people with comorbid MH problems.

### Key Practice Points:

- Lack of understanding of comorbid mental health (MH) problems can impact on physiotherapeutic treatment.
- MHFA is an effective way to teach MH literacy and communication strategies and reduce stigma associated with mental health problems.
- It is recommended that all physiotherapists and physiotherapy students complete MHFA training.

Proposed impact, if any, on the health of Aboriginal and Torres Strait Islander people: MHFA training may impact on service delivery for Aboriginal and Torres Strait Islander people, however, it is recommended that physiotherapists working with this group of people complete Aboriginal and Torres Strait Islanders MHFA.

## ASSISTIVE TECHNOLOGY FOR PEOPLE LIVING WITH MOTOR NEURON DISEASE: WHO NEEDS WHAT AND WHEN?

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**Aim:** Assistive technology device prescription for those living with motor neuron disease (MND) is challenging, due to varied patterns (clinical phenotypes) and speed of disease progression. This study explored the relationships between MND clinical phenotypes, Amyotrophic Lateral Sclerosis Functional Rating Scale – Revised (ALSFRS-R) and assistive technology use.

**Design:** Prospective, observational study.



**Method:** Participants were a consecutive sample of 269 patients with MND. Outcome measures were MND phenotype, ALSFRS-R scores and assistive technology devices in use.

**Results:** A total of 1456 items of assistive technology were used by participants. A significant difference in total concurrent assistive technology item use was found between phenotypes ( $p=0.001$ ); those with ALS Bulbar onset used least. There was a significant difference in assistive technology usage in five of seven assistive technology categories across the six clinical phenotypes, namely orthoses ( $p<0.000$ ), mobility devices ( $p<0.000$ ), transfer devices ( $p<0.000$ ), communication devices ( $p<0.000$ ), and activities of daily living devices ( $p=0.016$ ). Correlations between ALSFRS-R sub-score items and assistive technology count within each assistive technology category confirmed those with greater impairments in hand or leg strength used additional assistive technology items; 95% of participants with ALSFRS-R 'Walking' score of '0' used a lifting hoist and 79% a powered wheelchair.

**Conclusion:** Clinicians should consider MND phenotype and/or ALSFRS-R domain sub-score in clinical decision-making regarding assistive technology, as this determines pattern of disease and progression, and hence assistive technology required.

**Key Practice Points:**

- People with MND are high users of assistive technology.
- MND subtype and/or functional subscore influences assistive technology needs.

## GETTING A GRIP ON PAIN: DOES UPPER LIMB POSITION AFFECT PAIN-FREE GRIP FORCE IN INDIVIDUALS WITH LATERAL ELBOW TENDINOPATHY?

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**Aim:** To examine the influence of elbow and/or forearm position on absolute and relative pain-free grip force in individuals with unilateral lateral elbow tendinopathy.

**Design:** Cross-sectional cohort study.

**Method:** Twenty-one participants with unilateral lateral elbow tendinopathy performed pain-free grip of the symptomatic side, and maximal grip of the asymptomatic side, in four upper limb positions: 1) elbow flexed forearm pronated; 2) elbow flexed forearm neutral pronation/supination; 3) elbow extended forearm pronated; and 4) elbow extended forearm neutral pronation/supination. Pain-free grip was expressed as an absolute value, and relative to the maximal grip of the asymptomatic side, and analysed using a two-way (elbow x forearm) repeated measures analysis of variance, with post-hoc Bonferroni pairwise tests ( $\alpha=p<0.05$ ).

**Results:** Both absolute and relative pain-free grip were greater in position 2 (i.e. elbow flexed forearm neutral pronation/supination) than all other positions (Interaction:  $p=0.002$  and  $p=0.004$ , respectively). There were no differences between positions 1, 3, or 4 for absolute or relative pain-free grip.

**Conclusion:** Higher grip force occurred in elbow flexion with forearm neutral pronation/supination when compared to the other three positions. These findings indicate that elbow and forearm position should be standardised when measuring pain-free grip, especially if monitoring change over time.

**Key Practice Points:**

- Elbow and forearm position significantly affect pain-free grip in patients with unilateral elbow tendinopathy, both expressed in absolute terms or relative to the non-symptomatic side.

- Position of the elbow and forearm should be standardised when measuring pain-free grip in cases with lateral elbow tendinopathy, especially when repeating testing.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander People: There is no proposed impact of this research that is specific to health outcomes for indigenous populations.

## AUSTRALIAN AIRWAY CLEARANCE SERVICES FOR ADULTS WITH CHRONIC LUNG CONDITIONS: SCOPING REVIEW OF WEB-BASED SITES

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Aim: To identify and describe web-based information concerning Australian airway clearance services.

Design: Scoping review.

Method: Using a prospectively designed search strategy, Australian health websites (Local health network, public and private organisations) were searched between July and November 2018. Where specific airway clearance services were not identified, webpages were navigated for physiotherapy services. Data for service descriptors were extracted. All identified services were contacted to confirm currency and accuracy of web-based service descriptions.

Results: In total 328 websites were searched (131 local area health networks, 6 organisations, 191 public or private sites). Ten airway clearance services (4 publicly funded, 6 private services) were identified, all based in metropolitan areas of capital cities. Availability of service descriptor information varied across the 10 airway clearance services (clientele (9/10 services), referral processes (4/10) and types of airway clearance techniques available (5/10)). Of the 286 public physiotherapy services identified, 24 (8%) included descriptors of respiratory service provision. On direct telephone enquiry airway clearance intervention was confirmed as being available at 174/286 (61%) sites.

Conclusion: Web-based information for Australian airways clearance services did not accurately reflect service availability.

Key Practice Points:

- Ten specific Australian airway clearance services were identified.
- Respiratory physiotherapy service provision was rarely transparent in web-based information despite 61% of services confirming provision of airway clearance interventions.
- Direct contact (phone or email) of health services, notably physiotherapy staff affiliated with public services, was problematic and protracted due to clinical work duties and irregular staffing levels.

## BALLISTIC RESISTANCE TRAINING -FEASIBILITY, SAFETY AND EFFECTIVENESS FOR IMPROVING POWER AND MOBILITY IN ADULTS WITH NEUROLOGICAL CONDITIONS: A SYSTEMATIC REVIEW

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Aim: To determine if ballistic resistance training is feasible, safe and effective in improving muscle power generation and mobility in adults with neurological conditions.

Design: Systematic review



**Method:** A systematic review of nine academic databases was performed. Articles were included if they investigated ballistic training for adults with a neurological condition impacting on mobility. Data relating to safety, feasibility, strength, power and mobility underwent narrative synthesis.

**Results:** Thirteen articles describing nine studies met the inclusion criteria. Five studies were randomised controlled trials and four were cohort studies. Attendance rates were high and no study-related adverse events were reported. Power outcomes were reported in eight studies, with statistically significant differences between pre and post intervention measures. When compared to a control group, hip extension and abduction, and knee extension power generation was improved, whilst conflicting results were reported for hip and knee flexion and ankle plantarflexion. Mobility outcomes were reported in six studies. Self-selected walk speed was significantly faster post intervention in four of five studies, however findings of Timed Up and Go and Six Minute Walk Test measures remain inconclusive.

**Conclusion:** Ballistic training was safe and feasible for those with a neurological condition. The effect on muscle power generation and mobility was inconsistent.

**Key Practice Points:**

- Ballistic training was safe and feasible for adults with neurological conditions.
- It was effective for improving muscle power generation and self-selected gait speed.
- The impact of ballistic training on ankle power generation, the most important for forward propulsion, was only reported in one study.

## PHYSICAL ACTIVITY AND SLEEP IN PATIENTS WITH THE HYPERMOBILE EHLERS-DANLOS SYNDROME AND HYPERMOBILITY SPECTRUM DISORDER

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**Design and aim:** This cross-sectional study aimed to objectively evaluate physical activity and sleep by accelerometry in patients with Hypermobile Ehlers-Danlos Syndrome and Hypermobility Spectrum Disorder.

**Methods:** Twenty Belgian adult patients with hypermobile Ehlers-Danlos Syndrome, 23 with Hypermobility Spectrum Disorder and 33 healthy matched controls participated. Physical activity and sleep were measured with tri-axial accelerometers worn at the hip and wrist, respectively, during seven consecutive days and compared to the accepted norm of 10000 steps/day. Fatigue was daily evaluated by the Checklist Individual Strength.

**Results:** During the work week, step counts were significantly lower in the group with hypermobile Ehlers-Danlos Syndrome compared to the control group ( $p = 0.035$ ). Interestingly, significant lower step counts were observed for both patient and control groups compared to the accepted norm of 10000 steps/day ( $p < 0.001$ ). Although no differences were identified with regard to sleep efficiency, significantly higher fatigue has been observed in both patients groups during the work week ( $p < 0.001$ ). During the weekend, higher fatigue has only been found in the Hypermobility Spectrum Disorder cohort ( $p = 0.002$ ).

**Conclusion:** In general, these preliminary data indicate that patients with generalized hypermobility have reduced physical activity with fatigue as a major symptom. However, no differences in sleep efficiency were identified in both patient populations.

**Key Practice Points:**

- Fatigue is a major symptom and an important treatment target.
- Decreased physical activity levels have major consequences on quality of life and should be implemented in rehabilitation programs for patients with generalized hypermobility.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: This research is focused on patients with generalized hypermobility, therefore it is not specific for Aboriginal and Torres Strait Islander people.

## TRANSFORMING REHAB IN KNEE INJURY

Culvenor A<sup>1</sup>

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Current knee injury rehabilitation practices in Australia are concerning. Only 5% of Australians who suffer a serious knee injury, such as an anterior cruciate ligament (ACL) injury, receive evidence-based rehabilitation. These rehabilitation programs typically worship at the altar of rapid return to sport with little evidence of the considerable long-term burden being addressed. This is despite knee injury being the most important modifiable risk factor for knee osteoarthritis in men and second only to obesity in women. Early knee OA (on MRI) is evident in a third of young adults in the first year after knee injury. Alarming, cartilage, bone and menisci continue to deteriorate in half to two-thirds of knees over the following 4 years. The recently identified link between lower-limb muscle strength, function and early return to sport and OA development/progression and re-injury risk emphasises the key role that physiotherapists can play to optimise these modifiable risk factors during rehabilitation to keep these young adults from becoming major participants in our healthcare system. Growing appreciation that surgery for different knee injuries accelerates the early OA process only reinforces the vital role of optimal knee injury rehabilitation. A structurally unstable knee (i.e. ACL-deficient), can be functionally stable (i.e. great neuromuscular control). With the rates of serious knee injury on the rise, physiotherapists are ideally placed to optimise not only short-term outcomes with structured, progressive goal-orientated rehabilitation, but also the long-term burden to prevent an epidemic of young people suffering from old knees necessitating joint replacement at an earlier age.

### Key Practice Points:

- All individuals following serious knee injury should receive progressive, intensive, goal-orientated rehabilitation addressing short-term goals and long-term burden.
- Regular functional testing (e.g. hop tests) can motivate patients, increase adherence and be used as a tool for identifying readiness to return to sport, reducing re-injury and preventing osteoarthritis.
- Patient involvement is crucial throughout rehabilitation for clarifying expectations, implementation of prevention programs, and adherence to recommendations.

## PELVIC FLOOR DISORDERS AS A BARRIER TO EXERCISE: ARE WOMEN SEEKING HELP?

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**Aim:** Establish the presence and magnitude of impact of pelvic floor disorders (PFD) as a barrier to exercise participation and explore exercising women's disclosure of PFD symptoms.

**Design:** Cross-sectional, observational study.

**Method:** Women (n=4556) aged 18-65, with symptoms of PFD during exercise were recruited via social media. An online, anonymous survey was purpose-designed and piloted; validated PFD symptom questionnaires were embedded.

**Results:** When listed amongst previously established exercise barriers, leaking urine was the most frequently reported barrier (60.3%), even in women aged 18-25. Of those who identified urinary incontinence (UI) as a barrier, 60.4% reported it stopped their exercise participation often/all of the time. One in three (34.2%) with pelvic organ prolapse (POP) and 16.9% with anal incontinence (AI) reported their symptoms as a barrier to exercise. Only 26% had been asked if they experienced PFD symptoms during exercise.

Conclusion: This study, with a larger sample size than any previously published cohorts, identified symptoms of UI as the most frequently reported of all barriers to exercise in surveyed women. This is the first study to identify that like UI, POP and AI symptoms are also significant barriers to exercise participation. Low disclosure of symptoms may limit ability to seek appropriate healthcare.

Key Practice Points:

- Health professionals working with women should be aware that PFD is a barrier to exercise participation in women, including young, nulliparous athletes.
- Future research into screening and managing PFD in exercising women to address this modifiable barrier to physical activity is required.

## STUDENTS AS PATIENTS: A SYSTEMATIC REVIEW OF THE EFFECTS OF PEER SIMULATION ON COMMUNICATION AND EMPATHY

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Aim: Simulation based education (SBE) is widely used in physiotherapy education. Peer simulation, where students portray simulated patient (SP) roles, is an alternative to learning with SPs. This systematic review aimed to determine the impact of peer simulation on learning outcomes of entry-level health professional students.

Design: Systematic review, PROSPERO registration: CRD42018091754.

Method: Seven databases searched (to 1st February 2018) using terms including peer simulation, role-play and simulated/standardised patient. Included studies described a health professional student SBE interaction involving peer simulation. Data on communication and empathy skills were extracted by two independent investigators. Study quality was assessed using MERSQI and CASP. Meta-analysis was conducted where possible, otherwise descriptive analysis was completed.

Results: Twelve studies were identified. Peer simulation appeared to positively impact student development of empathy. Meta-analysis demonstrated no significant difference in development of communication skills between learning with SPs and peer simulation (standard mean difference=0.22, 95% CI=-0.21 to 0.66). Students perceived peer simulation as comparably valuable, and often superior to, other forms of learning.

Conclusion: Peer simulation supports student development of communication and patient empathy, offering an alternative to learning with SPs. Challenges in defining peer simulation, study heterogeneity, and study reporting inconsistencies were noted.

Key Practice Points:

Peer simulation:

- Appears to positively impact development of communication and empathy skills, and may encourage development of collaborative practitioners (Practice threshold 5.1, AHPRA 2016).
- Appears to be effective and well-received by students.
- May be more viable than current models of SBE due to availability of students to portray the patient role.

## DEMYSTIFYING MUSCULOSKELETAL PAIN MANAGEMENT: EXPERT PANEL CASE ANALYSIS FROM DIAGNOSTIC, PSYCHOSOCIAL AND OCCUPATIONAL PERSPECTIVES

Daly A, Elvish D, Mitchell T

Assessment and management of the patient with a complex pain presentation can be challenging at the best of times. The presence of mixed pain features, mood issues, feelings of injustice and anger, family, work, financial and lifestyle

stressors can leave even the experienced practitioner with confusion over what and how to assess and therefore what management strategies to turn to and to prioritise.

In this Mini-Keynote session, an expert panel of clinicians will aim to deconstruct and simplify the assessment and management of a patient with a complex musculoskeletal pain presentation. We will examine the case study of Paula, whose life has been turned upside down following a motor vehicle accident. Paula's story will likely be representative of many of the patients that present in clinical practice.

The session will cover the comprehensive assessment of Paula through utilisation of a multi-faceted and structured, yet time conscious, approach. The panel will debate both the pertinent findings from the assessment and also strategies for prioritising treatment selection to achieve optimal treatment response. Further deliberation from the panel will then cover factors that may impact possible clinical decision-making processes regarding Paula's ongoing response to treatment. Discussion involving the additional demands of dealing with compensable bodies and other stakeholders will also be covered.

It is the intent of the session for participants to leave the session with an expanded, yet streamlined skillset for working with patients like Paula who present with complex musculoskeletal pain.

#### Key Practice Points:

After this presentation, participants will be able to:

- Understand the benefit of, and how to implement, a structured and time-efficient assessment of a patient with a complex musculoskeletal pain presentation.
- Understand how assessment findings can enhance the clinical decision-making skillset to prioritise treatment selection and deliver improved treatment responses.
- Develop additional skills to continually monitor and address treatment responses and remaining barriers to recovery over the course of intervention

## OVERCOMING PAIN RELATED FEAR OF MOVEMENT: THEORY AND PRACTICAL APPLICATIONS FOR THE AQUATIC PHYSIOTHERAPIST

Daly A<sup>1</sup>

<sup>1</sup>The PainCare Collective, Melbourne, Australia

Pain related fear of movement, often referred to as kinesiophobia, can be a major barrier to people with persistent pain making functional gains during treatment interventions. Physiotherapists run the risk of being unaware of this fear as it often results in avoidance behaviours which can mask the problem. Alternatively, clinicians can inadvertently worsen fear and avoidance by confronting feared movements and activities too aggressively or can be ineffective by not acknowledging and addressing the fear at all. This presentation will explore some of the theory underlying pain related fear and avoidance behaviours and suggest clinically achievable methods of working with people for whom pain related fear of movement is a major barrier. The unique aspects of the pool environment will be considered as well as assessment, reassessment and progression to land based activities.

#### Key Practice Points:

After this presentation, participants will be able to:

- understand the theory behind pain related fear avoidance behaviours,
- recognise pain related fear avoidance in their patients,
- plan and implement treatment interventions that take into account pain related fear avoidance,
- utilise appropriate assessment and reassessment tools to evaluate the effectiveness of their intervention.

## PUTTING YOUR PERSONAL WELLBEING FIRST IS CRITICAL TO THE PROFESSION

Davidson G<sup>1</sup>, Pelling N

<sup>1</sup>Mindful Movement Physiotherapy, Adelaide, Australia

Health care professionals tend to the needs of others to help them function at their best. However, the ability to provide care in the short-term and also have an enduring, satisfying career is underpinned by self-care. In this presentation, Dr Stallman will focus on the components of self-care will be situated within the biopsychosocial model of health and wellbeing. The science of impact of poor self-care—sleep, nutrition, exercise, belonging and coping—will be explored. Finally, the rationale and steps in using the innovative Coping Planning approach to changing from unhealthy to healthy coping strategies will be outlined.

Ms Georgie Davidson will focus on the role of mindfulness in building our inner strengths and resources to take better care of ourselves and support personal happiness, health and a sense of meaning. Mindfulness is the human trait of paying attention with a curious and non-judgemental attitude to what is happening in the present moment in the internal world of sensations, thoughts and emotions and in the world around. Mindfulness is also a skill that can be further developed with practice. Research has found that a regular practice reduces stress, improves physical and mental health, fosters better personal and therapeutic relationships, and reduces burnout in health professionals. Evidence suggests that these positive outcomes are mediated by neurophysiological changes supporting metacognition, body awareness, attentional control, emotional and autonomic self-regulation and compassion to self and others.

## PILOTING A CLINICAL TRIAL TO REDUCE PERSISTING SYMPTOMS FOLLOWING CHILD CONCUSSION – A PHYSIOTHERAPY PERSPECTIVE

Davies K<sup>1,2</sup>, Anderson V<sup>2,3,4,5</sup>, Davis G<sup>2</sup>, Takagi M<sup>2,3</sup>, McKinlay A<sup>2,3</sup>, Babl F<sup>2,4,6</sup>, Crichton A<sup>2</sup>, Hearps S<sup>2</sup>, Clarke C<sup>2</sup>, Rausa V<sup>2</sup>, Anderson N<sup>2</sup>, Barnett P<sup>2,4,6</sup>, Dunne K<sup>2,7</sup>

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**Aim:** To pilot a multimodal (physiotherapy and psychology) intervention program for management of persistent post-concussive symptoms in children.

**Design:** Pilot AB design study with baseline primary and secondary measures, intervention and follow up measures.

**Method:** Participants were screened and recruited following presentation to the Royal Children's Hospital, Melbourne using the Post-Concussion Symptom Inventory which was the primary outcome measure. Subjects who remained symptomatic at 4 weeks entered the study. Physical and psychological secondary measures were taken at baseline (four weeks), three and six month follow up. Physical measures included: ocular and vestibular function, cervical integrity and strength, response to increased heart rate and balance. Participants completed a multimodal 8-week intervention program, comprised of symptom-specific modules delivered by physiotherapists, paediatricians and neuropsychologists. Results were compared to that of our prospective longitudinal cohort which included identical time points.

**Results:** Nine participants completed the intervention. Wilcoxon signed-rank test revealed a significant decrease in symptoms as measured by the primary outcome measure ( $p=0.002$ ). Further, upon completion of the intervention, 80% had fully returned to school (62.5% at baseline), 80% had fully returned to sport (50% at baseline) and 100% had returned to normal activities (50% at baseline). Physical measures across all domains demonstrated improvement.

**Conclusions:** Preliminary evidence supports the efficacy of multimodal intervention to reduce persistent concussion symptoms in children with delayed recovery post-concussion. This pilot supports a need for a larger randomised controlled trial.

**Key Practice Points:**

- Physiotherapy and psychological management may decrease symptoms and improve outcomes in child concussion resulting in an earlier return to school and sport.
- Specific, individualised treatment can improve secondary physical measures of impairment in persistent post-concussion symptoms.

## TURN AROUND THE 80% INACTIVITY RATE IN MULTIPLE SCLEROSIS THROUGH HIGH INTENSITY EXERCISE AND HEALTH BEHAVIOR CHANGE

**Davy G<sup>1</sup>**

<sup>1</sup>Connect Neuro Physiotherapy, Auckland / Massey, New Zealand

**Background:** Inactivity in individuals living with Multiple Sclerosis remains high at 80%, although most concerning is that this figure has not changed for the last 25 years. Even though evidence supports positive outcomes with increased physical activity and exercise. A population struggling with fear, fatigue, poor referral rates and vague guidelines around exercise. Physiotherapist are in a prime position to significantly influence both the newly diagnosed and the progressive course of MS.

**Aims/objectives:** The aim of this session is to present the latest evidence based clinical approaches to treating individuals with MS utilising the format of the recently launch MS Get a Head Start program. Details will be provided about why high intensity interval training combined with educational topics is creating positive health behavior changes for those living with MS.

The scope of the presentation will cover how to best manage fatigue, neuromuscular fatigue and symptom exacerbation brought on by exercise due to heat sensitivity. Participants will be provided with practical clinically applicable skills that can be utilised immediately.

**Approach:** The presentation will be delivered in a lecture format with supporting power point slides. Copies of the handout and further resources will be supplied.

### Key Practice Points:

- Participants will have sound knowledge of how to safely deliver high intensity interval training to avoid neuromuscular fatigue.
- Participants will be able to educate individuals with MS on how to manage symptom exacerbation experienced during exercise.
- Participants will be motivated to embrace the opportunity there is to assist the newly diagnosed MS individual.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples:**

This clinical approach is likely to have no greater impact on the Aboriginal and Torres Strait Islander population than that of the non-Indigenous population.

## HOW DOES COMPLETING AN IRONMAN TRIATHLON AFFECT POSTURAL CONTROL?

**De Amorim H<sup>1</sup>**, Santos G<sup>1</sup>, Mochizuki L<sup>3</sup>, Pappas E<sup>2</sup>, Parizotto P<sup>1</sup>, Lima V<sup>1</sup>, Buzzi C<sup>1</sup>

<sup>1</sup>State University of Santa Catarina (UDESC), Coqueiros - Florianópolis, Brazil, <sup>2</sup>Faculty of Health Sciences, The University of Sydney, Sydney, Australia, <sup>3</sup>Sao Paulo University EACH-USP, Sao Paulo, Brazil

**Aim:** To investigate postural control in three different positions before and after an Ironman competition. We hypothesized that postural control would decrease after completing an Ironman competition. Approval Opinion of the Ethics Committee - number: 1,087,547.

**Design:** Cross-sectional, collected data pre- and post-completing an Ironman competition (3.8 km of swimming, 180 km of cycling, and 42.2 km of running).

**Method:** Forty-nine volunteers who completed the Ironman within the 17 hour limit underwent balance evaluation using the force plate VSRTM Sport. The area of the center of pressure was assessed pre- and post-competition in the bipedal, unipedal, and tandem postures.

**Results:** There was a significant post-competition reduction in balance in all three postures, with no significant interaction effects.

**Conclusion:** The findings showed reduced postural control, suggesting that completing an Ironman causes temporary balance impairments.

**Key Practice Points:**

- After extreme sports athletes complete an event (e.g. Ironman) it may be beneficial to avoid activities that may challenge their balance to avoid injuries.
- Future research should investigate the time that it takes for balance to return to baseline values.

## A CENTRAL TRIAGE PROTOCOL FOR SPINAL REFERRALS: PHYSIOTHERAPIST, SURGEON AND RHEUMATOLOGIST AGREEMENT AND RESULTANT PATIENT OUTCOMES.

**De Gruchy A<sup>1</sup>**, Phan U<sup>1</sup>, Cunningham J<sup>1</sup>, Yuen T<sup>1</sup>, Wicks I<sup>1</sup>, Moi J<sup>1</sup>

<sup>1</sup>Melbourne Health, Parkville, Australia

**Aim:** To describe the development, implementation and evaluation of a novel central triage protocol for managing referrals to hospital outpatient spinal surgical services.

**Design:** Prospective cohort study.

**Methods:** This prospective implementation study tested a novel central triage protocol on 258 spinal referrals to an Australian tertiary hospital over 6 months. The protocol was tested on 4 clinicians; orthopaedic spinal surgeon, neurosurgeon, rheumatologist and advanced musculoskeletal physiotherapist. Outcome measures included clinician agreement with triage decisions and patient outcomes. Consensus criteria for triaging referrals were developed through the central triage process.

**Results:** Clinicians reached consensus in 80.2% (n=207) of triage decisions using the central triage protocol (Kappa value of 0.637). Physiotherapist and neurosurgeon had greatest levels of agreement, agreeing on 95.7% of referrals. Patients triaged to non-surgical outpatient clinics had low referral rates back to surgical services (n=5, 2.6%), while patients triaged to surgical clinics had conversion rates to surgery of 22.6% (n = 7), with historical conversion rates averaging 5%.

**Conclusion:** Initial results indicate that a central triage protocol is effective for determining the most appropriate care for referrals to outpatient spinal surgical services, in particular when non-surgical and surgical care may be indicated. The protocol was effectively implemented independent of clinician occupation. This is supported by good clinician agreement with triage decisions, enhanced conversion rates to surgery and less inappropriate referrals to spinal surgery clinics.

## TWELVE-MONTH RESULTS FROM THE BACK PAIN ASSESSMENT CLINIC (BAC) PROSPECTIVE COHORT STUDY

**De Gruchy A<sup>1</sup>**, Phan U<sup>1</sup>, Yuen T<sup>1</sup>, Cunningham J<sup>1</sup>, Wicks I<sup>1</sup>, Moi J<sup>1</sup>

<sup>1</sup>Melbourne Health, Parkville, Australia

**Aim:** To report on the design, implementation and evaluation of the safety and effectiveness of the Back pain Assessment Clinic (BAC) model.

**Design:** prospective cohort study.



**Methods:** The study occurred across tertiary and primary care settings. Participants were adult patients with spinal pain complaints referred for outpatient surgical review. Data were obtained by auditing BAC activity (22 July 2014 to 30 June 2015) and conducting surveys and interviews of patients, stakeholders and referrers. Continued data on safety and effectiveness has occurred via service audit from 2015 to 2019. The model was assessed via the VIRIAF, concentrating on outcomes: (1) access to care; (2) appropriate and safe care; (3) workforce optimisation and integration; and (4) efficiency and sustainability.

**Results:** A total of 522 patients were seen during the study period. Most were referred to hospital services by general practitioners (87%) for LBP (63%) and neck pain (24%). All patients were seen within 10 weeks of referral and commenced community-based allied health intervention within 2–4 weeks of assessment in BAC. Of patients seen, 34% had medications adjusted, 57% were referred for physiotherapy, 3.2% to pain services, 1.1% to rheumatology and 1.8% for surgical review. Less MRI scans were ordered in BAC (6.4%) compared with traditional spinal surgical clinics (89.8%), which translated to a cost-saving of \$52 560 over 12 months. Patient and staff satisfaction was high. There have been no patient complaints or adverse incidents. Annual audit continuing 3 years beyond the original pilot study has shown continued safety, effectiveness and has shown improved conversion to surgery rates for the population referred on from BAC to surgical services.

**Conclusion:** Evaluation of the BAC suggests it is a safe, effective and cost-saving alternative model of care for the management of spinal pain complaints.

## TELEREHABILITATION FOR KNEE OSTEOARTHRITIS IN A DEVELOPING COUNTRY (BRAZIL): A PRE-POST FEASIBILITY STUDY

**De Noronha M<sup>1</sup>**, Aily J<sup>2</sup>, Barton C<sup>3</sup>, D Oliveira Silva D<sup>4</sup>, M Mattiello S<sup>2</sup>

<sup>1</sup>La Trobe University - Rural Health School, Bendigo, Australia, <sup>2</sup>Universidade Federal de São Carlos - Department of Physiotherapy, São Carlos, Brazil, <sup>3</sup>La Trobe University - School of Allied Health - LASEM Research Centre, Melbourne, Australia, <sup>4</sup>Universidade Estadual de São Paulo - Department of Physiotherapy, Presidente Prudente, Brazil

**Aim:** Telerehabilitation effectiveness for people with knee osteoarthritis may depend on patient's adherence (accessibility and familiarity) to interventions. We investigated whether people with knee osteoarthritis would adhere to exercise-therapy facilitated via multiple media (DVD, web-based and booklet) in Brazil, a developing economy.

**Design:** Pre-post intervention, feasibility study

**Method:** Middle aged (40-50 years; n=13) and elderly (≥70 years; n=16) people with knee osteoarthritis received face-to-face exercise-therapy instructions on the first day along with a booklet and DVD (videos) to take home. Participants also received six motivational phone calls throughout the 12 week treatment. From week 6, exercise videos were also provided online (<http://exercicio-joelho.treeducation.org>). Satisfaction and adherence were assessed one week after intervention with the Exercise Adherence Rating Scale (EARS), sections B and C. Additionally, 3 open-ended questions related to preferences for exercise instructions were answered via a survey.

**Results:** The EARS scores showed good adherence to exercise for all participants (section B). Section C scores showed that most participants overcome circumstances that hinder adherence. Survey results indicated that videos were considered helpful, but generally the preferred supporting media was the booklet, followed by DVD and internet.

**Conclusion:** Telerehabilitation, with various media options to facilitate exercise-therapy adherence was well accepted by middle-aged and elderly Brazilians with knee osteoarthritis. Booklets with exercises descriptions to enhance adherence were preferred over DVD and online videos.

**Key Practice Points:**

- Telerehabilitation is well accepted by Brazilians with knee osteoarthritis



- Booklets remain a viable and preferred media to provide exercise guidance to people with knee osteoarthritis in Brazil.

## THE ASSOCIATION BETWEEN CERVICAL SENSORIMOTOR CONTROL AND CHRONIC IDIOPATHIC NECK PAIN: A SIX-MONTH LONGITUDINAL STUDY

**de Zoete R<sup>1,2,3,4</sup>**, Osmotherly P<sup>1,2,3</sup>, Rivett D<sup>1,2,3</sup>, Snodgrass S<sup>1,2,3</sup>

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<sup>4</sup>*Recover Injury Research Centre, The University Of Queensland, Herston, Australia*

**Aim:** To investigate the association between cervical sensorimotor control and chronic idiopathic neck pain.

**Design:** Longitudinal observational study: 50 individuals with chronic idiopathic neck pain and 50 asymptomatic controls.

**Method:** Cervical sensorimotor control was assessed at baseline (both groups), four-weeks (neck pain only), eight-weeks (neck pain), and six-months (both groups). The cervical sensorimotor control tests (including 14 test conditions) were: joint position error, postural balance, subjective visual vertical, head tilt response, The Fly®, smooth pursuit neck torsion, and head steadiness. Linear mixed regression models were used to investigate whether neck pain, neck disability, and neck pain duration were associated with cervical sensorimotor control outcomes.

**Results:** Neck pain intensity was associated with balance (torsion, eyes open) at one of four time points (four-weeks,  $p=.035$ ), and not with any of the 13 other cervical sensorimotor control outcomes. Neck disability was associated with balance (eyes open) at baseline ( $p=.039$ ) and head steadiness (high load) at eight-weeks ( $p=.004$ ), and not with other outcomes. Neck pain duration was not associated with any cervical sensorimotor control outcomes.

**Conclusion:** There were only two associations between chronic idiopathic neck pain and cervical sensorimotor control outcomes. Although statistically significant, these associations were weak and thus likely to be chance findings.

**Key Practice Points:**

- As changes in pain and disability are not associated with cervical sensorimotor control, these tests may not provide relevant information for the management of individuals with chronic idiopathic neck pain.
- With currently available tests, the clinical usefulness of cervical sensorimotor control outcomes is questionable.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** These results are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## THE CENTRAL NEUROBIOLOGICAL EFFECTS OF PHYSICAL EXERCISE IN INDIVIDUALS WITH CHRONIC MUSCULOSKELETAL PAIN: A SYSTEMATIC REVIEW

**de Zoete R<sup>1</sup>**, Chen K<sup>1</sup>, Sterling M<sup>1</sup>

<sup>1</sup>*Recover Injury Research Centre, NHMRC Centre of Research Excellence in Recovery Following Road Traffic Injuries, The University Of Queensland, Herston, Australia*

**Aim:** To investigate the central neurobiological effects of physical exercise in individuals with chronic musculoskeletal pain.

**Design:** Systematic review.

**Method:** Four databases were searched. Titles and abstracts firstly, and full-texts secondly, were independently screened by two researchers in two stages. The methodological quality of the included studies was assessed by two reviewers using the PEDro scale. Data were extracted using a standardised data extraction table.

Results: Of 4011 records screened for eligibility, four studies were included. All studies reported functional magnetic resonance imaging outcomes following an exercise intervention. Although type and dosage of reported interventions, brain regions of interest, and imaging procedures differed substantially, all studies identified significant exercise-induced changes in brain characteristics. Alongside these neurological changes, three studies reported significant improvements in clinical outcomes.

Conclusion: Four studies demonstrate that physical exercise exerts functional brain changes in individuals with chronic pain. The small number of included studies did not allow for meta-analysis, and more evidence is needed to confirm this suggestion. Potentially different effects of different types and dosages of exercise interventions should be investigated. Due to the small sample sizes of included studies, the results have to be interpreted with caution as individual studies are likely to be underpowered.

Key Practice Points:

- Physical exercise exerted functional brain changes in individuals with chronic pain in four studies. Three of these present improvements in clinical outcomes, suggesting the potential clinical relevance of these brain characteristics.
- Further research is needed to investigate whether physical exercise could normalise abnormal brain properties.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: These results are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## MOTOR OUTCOMES FOR VERY PRETERM INFANTS AT 4 - 5 YEARS OF AGE

Deegan W<sup>1</sup>

<sup>1</sup>Flinders Medical Centre, Adelaide, Australia

Aim : To describe motor outcomes of infants born very pre-term (< 30 weeks gestation or < 1250 grams birthweight) at Flinders Medical Centre, South Australia, relative to normative scores for children at 4 ½ years.

Design: Retrospective cohort study.

Method: Peabody Developmental Motor Scales – 2nd edition (PDMS-2) gross and fine motor scores at 4 ½ years of age were extracted from the neonatal database and preliminary descriptive analyses were undertaken for gross and fine motor skills, subtests and gender.

Results: Information was obtained from 168 preterm infants. PDMS-2 scores were below the average range for 12 % for gross motor and 21% for fine motor scores. Fine motor quotients tended to be lower for boys ( $89.7 \pm 15.1$ ) than girls ( $99.4 \pm 10.6$ ) but were still within the average range (85 -115).

PDMS-2 subtest mean standard scores for object manipulation (ball skills) ( $8.4 \pm 1.7$ ) and grasp ( $8.2 \pm 2.8$ ) were lower than the stationary, locomotor and visual-motor integration subtests. The normative mean for subtest scores is  $10 \pm 3$ .

Conclusion: The majority of very preterm infants scored in the average range for gross and fine motor skills using the PDMS-2 at 4 ½ years of age. Boys tended to score lower than girls for fine motor skills. Ball skills and grasp scored lower than other motor skills.

Key Practice Points:

- Very preterm infants benefit from monitoring and/or intervention for gross and fine motor skill development in the preschool period.
- Outcome measures can provide guidance for intervention.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: It is unknown whether these results apply to Aboriginal and Torres Strait Islander peoples as very few of the children in this cohort were Aboriginal and Torres Strait Islanders.

## EXERCISE-BASED, MULTIDISCIPLINARY CANCER REHABILITATION PROGRAMS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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<sup>5</sup>Peninsula Health, Frankston, Aus

**Aim:** Determine whether exercise-based, multidisciplinary cancer rehabilitation programs improve health service and patient-level outcomes.

**Design:** A systematic review of randomised controlled trials with meta-analysis.

**Method:** Trials evaluating exercise-based, multidisciplinary rehabilitation programs on adults diagnosed with cancer were included. Primary outcomes were related to improving health service delivery (costs, length of stay, health service utilisation). Secondary outcomes included patient outcomes (quality of life, fitness, physical activity and mood)

**Results:** Eighteen randomised controlled trials involving 1983 participants were included. On average, programs were run once or twice weekly over 12 weeks (SD 11) by physiotherapists (9 trials) in a hospital setting after cancer treatment completion (12 trials). Programs were well attended with few adverse events. No trials reviewed health service outcomes. Rehabilitation significantly improved quality of life (SMD 0.83, 95% CI 0.12 to 1.54), reduced anxiety (SMD -0.27, 95% CI -0.45 to -0.08) and depression (SMD -0.31, 95% CI -0.49 to -0.12) compared to usual care. There was no difference between multidisciplinary rehabilitation and exercise only (2 trials). Early rehabilitation was associated with reduced fatigue and maintaining muscle mass.

**Conclusion:** Multi-disciplinary, exercise-based cancer rehabilitation is safe and with high levels of adherence. Programs improve quality of life and mood compared to usual care. However, there is no evidence to determine their effect at a health service level.

**Key Practice Points:**

- Cancer rehabilitation is safe and improves quality of life and mood.
- Exercise-only programs may be as effective a multidisciplinary programs.
- The cost/benefit of cancer rehabilitation programs for health services remains unknown.

## ANALYSIS OF THE IMPACT OF PHYSICAL ACTIVITY ON 10-YEAR HEALTH OUTCOMES IN ADULTS WITH CYSTIC FIBROSIS

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<sup>1</sup>Discipline of Physiotherapy, University of Sydney; Department of Respiratory Medicine, Royal Prince Alfred Hospital, Sydney, Sydney, Australia

**Background:** For adults with Cystic Fibrosis (CF), higher levels of physical activity are associated with improved exercise capacity and quality of life, as well as reduced decline in lung function and bone mineral density. To date, the impact of physical activity on long-term health outcomes, including transplantation, survival, hospitalisation and CF-related diabetes, is unknown.

**Aim:** Analyse differences in 10-year health outcomes (lung transplantation, survival, hospitalisation, lung function, bone mineral density and glucose tolerance) according to moderate-vigorous physical activity (MVPA) in adults with CF.

**Methods:** Between 2007-2008, 104 adults from the RPA CF clinic reported their MVPA (mean age 29±10 years, 45 female, FEV1 63±24 %predicted) in a research study on exercise behaviour. Participants were prospectively classified as

achieving or not achieving physical activity recommendations (defined as  $\geq 150$  minutes of MVPA/week). Health data were collected from RPA hospital records over the following 10-year period. Participants were censored at the time of transplantation or death. The mean follow-up period was  $7.5 \pm 3.2$  years (range 0-10).

Results: 48 adults were prospectively classified as achieving physical activity recommendations ("high activity") and 56 were not ("low activity"). The demographic and clinical characteristics of the groups were similar at baseline for age, sex, lung function, bone mineral density, glucose tolerance and hospitalisations in the previous year. There was a trend for reduced incidence of transplantation or death in the "high activity" compared to the "low activity" group (27% v 43%,  $p=0.09$ ). There was significantly longer time to transplantation or death in the "high activity" compared to the "low activity" group ( $p<0.05$ ), taking 3.1 years longer until 25% of participants had lung transplantation or died. Data for other health outcomes will be analysed and presented at the 2019 APA Conference.

Conclusion: Higher levels of MVPA increased time to transplantation or death in adults with CF.

## LOW BACK PAIN IN COMPENSATED AUSTRALIAN WORKERS: A RETROSPECTIVE COHORT STUDY

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<sup>1</sup>School of Public Health and Preventive Medicine - Monash University, Melbourne, Australia

Aim: To describe the incidence and duration of working time-loss claims in compensated Australian workers with low back pain, compared to other musculoskeletal conditions.

Design: A retrospective cohort analysis of a large national administrative database of workers' compensation claims.

Methods: Accepted workers' compensation time-loss claims for low back pain, limb fracture, and limb soft-tissue disease that occurred between July 2010 and July 2015 were included. Data included demographic information, occupation, industry, and total time-loss. Descriptive statistics reported frequencies, relative risks, and median time-loss. Multivariate Cox hazard models were used to determine factors associated with time-loss.

Results: There were 55,861 low back pain claims, 42,661 limb fracture claims, and 18,176 limb soft tissue disease claims. Workers who were male, older, or with physical occupations were at greater risk of a low back pain claim relative to limb fracture. Low back pain claims had longer median time-loss (9.39 weeks) than limb fracture (9.22 weeks). Low back pain claims initially had a greater likelihood of a cessation of compensation than limb fractures, but lower likelihood after 6 weeks' time-loss.

Conclusion: The incidence and median time-loss of low back pain claims in Australian workers is relatively high compared to other musculoskeletal conditions. The time-dependent likelihood of a return-to-work for workers with low back pain compared to limb fractures appears to align with the typical clinical recovery timelines of each condition.

Key Practice Points:

- Clinicians should consider the role of recovery patterns of low back pain and limb fracture when understanding and planning patient return-to-work.

## DEPRESSION IN CHRONIC PAIN: EXPLORING STRESS RELATED INFLUENCES

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<sup>1</sup>University of South Australia, Adelaide, Australia

Aim:

Investigate socio-demographic, lifestyle, health and genetic drivers in the relationship between chronic pain and depression.

Design:

Observational prospective cohort (1958BC), allowing investigation of chronic pain and future depression risk.

#### Methods:

Depression outcomes comprised 'Clinical Interview Schedule – Revised', 45 years & 'Mental Health Index', 50 years. Chronic widespread (CWP) and chronic low back pain (CLBP) were self-reported. Cross-sectional and prospective associations were analysed via logistic regression, adjusting for lifestyle, socio-demographic and health factors. A genetic risk score (GRS) was constructed using stress related genetic variants from genome-wide association studies.

#### Results:

CWP associated with depression cross-sectionally (OR 2.03, 95% CI 1.63 to 2.51,  $p < 0.001$ ,  $N = 7629$ ) and prospectively (odds ratio 1.46, 95% CI 1.18 to 1.81,  $p < 0.001$ ,  $N = 6275$ ), fully adjusted. No cross-sectional association was apparent between CLBP and depression. Prospective association between CLBP and depression was apparent at baseline, and when fully adjusted (OR: 1.28, 95% CI 1.02 to 1.62,  $p = 0.03$ ,  $N = 6288$ ). The stress-GRS was not significantly associated with depression (per allele OR: 1.02, 95% CI 0.99 to 1.06,  $p = 0.14$ ,  $N = 5367$ ), nor did it affect CWP or CLBP associations with depression ( $p > 0.16$  respectively).

#### Conclusion:

CWP and depression were related cross-sectionally and prospectively. CLBP was related to depression prospectively. Despite over 4900 individuals, our GRS may have lacked power to detect genetic influences on the chronic pain-depression relationship.

#### Key Practice Points:

- Persistent regional and widespread pain influences future depression risk. Early screening is imperative.

## IMPLEMENTATION OF A TRAINING PACKAGE TO SUPPORT AND PROMOTE THE USE OF TELEPRACTICE BY CLINICIANS (ACROSS DISCIPLINES) FOR OUTPATIENTS

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Aim: to develop, implement and evaluate a telepractice training package for clinicians at Redland Hospital.

Design: Prospective cohort study.

Method: Telepractice training has been delivered to staff across 3 teams: Chronic Disease, Physiotherapy and Speech Pathology. The training has consisted of; an introductory PowerPoint presentation, self-paced online training, access to a training manual and printed resources, practical demonstrations and clinical simulations. Pre- and post-training surveys were used to measure change in clinicians' perceived skill, confidence and perceptions using telepractice for outpatient related activities. The pre- and post-comparisons collected from the clinician surveys were analysed using non-parametric Wilcoxon signed-rank tests.

Results: Statistically significant ( $p < 0.001$ ) increases in perceived knowledge were seen post-training as well as significant increases in confidence for both clinical and non-clinical use of videoconferencing post-training. Results to date suggest that a telepractice training package is an effective method of developing and sustaining staff skill, knowledge and confidence in the use of telepractice.

Conclusions: The preliminary results suggest that a comprehensive and varied training package is effective in increasing perceived skills and knowledge and increasing confidence for both clinical and non-clinical uses of videoconferencing.

#### Key Practice Points:

- A comprehensive and varied telepractice training package is effective in increasing perceived skills, knowledge and confidence for clinicians.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research has no direct impact on Aboriginal and Torres Strait Islander people but will likely benefit all clients equally.

## A SYSTEMATIC REVIEW OF ASSESSMENT TOOLS AND FACTORS USED TO PREDICT DISCHARGE FROM ACUTE GENERAL MEDICAL WARDS

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**Aim:** To identify assessment tools and patient factors associated with discharge destination (home, subacute or residential care) in general medical inpatients.

**Design:** Systematic review

**Method:** Four electronic databases were searched. Studies were eligible for inclusion if they were: a prospective or retrospective quantitative study design, had a minimum of 20 adult acute general medical inpatients and published in English. Outcomes of interests were assessment tools (scored questionnaires or performance-based measures) or patient factors (single items) with statistical correlations with discharge destination. Articles were screened by two independent assessors. Data were extracted by one reviewer and independently checked by a second reviewer. Data were analysed/described descriptively.

**Results:** Twenty-one studies were included. Within included studies, tools and factors spanned 'cognitive', 'functional', 'mobility', 'medical', 'social' and 'other' domains. Twenty assessment tools were identified. The most common tools were the Barthel Index, Katz Activity of Daily Living Index and Post-Acute Care (at) Discharge however, each of these were found in two articles each within the literature identified in this review. Thirty-nine factors were identified. The most commonly researched factor was age (investigated in eight studies).

**Conclusion:** No single assessment tool that best predicts discharge destination was identified for this complex cohort. Further research is needed to determine the psychometric properties of the tools identified as well as additional predictors of subacute care.

**Trial Registration:** PROSPERO (CRD42017064209)

**Key Practice Points**

- The large number of tools and factors found, as well as their distribution across several domains, exemplifies the complexities of discharge planning.

## INTEGRATED 24-HOUR TIME USE RATHER THAN PHYSICAL ACTIVITY, SEDENTARY TIME AND SLEEP: ASSOCIATIONS WITH HEALTH OUTCOMES IN AUSTRALIAN CHILDREN

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**Aim:** The health impacts of physical activity, sedentary time and sleep are usually studied separately, ignoring that they are parts of a 24-hour day. More time spent in one of these behaviours necessarily means less time spent in others – either or both of which could cause the observed health impacts. This study explored the associations between 24-hour time use (moderate-to-vigorous physical activity [MVPA], light physical activity, sedentary time and sleep) and a range of health outcomes.

**Design:** Population-based cross-sectional Child Health CheckPoint

**Methods:** Participants were n=938 11-12 year olds, 50% boys. **Exposure:** Daily activity behaviours measured by accelerometry. **Outcomes:** Body mass index z-score (zBMI) from measured height and weight; Cholesterol-to-HDL ratio and GlycA (inflammatory marker) concentrations from biometric analysis of blood; Health-Related Quality of Life

(HRQoL) from PedsQL. Analysis: Compositional linear regression models adjusted for sex, age, puberty and socioeconomic position to estimate the difference in health outcomes associated with differences in time use.

Results: For zBMI and HRQoL: MVPA ( $p=0.01$ ;  $p<0.001$ ) and sleep ( $p<0.001$ ;  $p=0.02$ ) were favourable, whilst sedentary time ( $p=0.04$ ;  $p<0.001$ ) and light physical activity (zBMI only,  $p=0.03$ ) were unfavourable. For biomarkers of Cholesterol-to-HDL ratio and GlycA: MVPA was favourable (both  $p<0.001$ ) whilst sedentary time was unfavourable ( $p=0.01$ ;  $p=0.04$ ).

Conclusion: More MVPA and sleep at the expense of sedentary time may contribute to better health.

Key Practice Points:

- Think about activity in a 24-h context
- Suggest replacing sedentary time with MVPA and/or sleep
- Light physical activity may not be enough.

## THE LIVED EXPERIENCE OF PARENTING A CHILD WITH HIP DYSPLASIA: IN-DEPTH KNOWLEDGE CAN TRANSFORM THE PARENTING EXPERIENCE

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Aim: To explore in-depth the experience of parenting a child with developmental dysplasia of the hip, with a focus on the impact of physiotherapy intervention on this experience.

Design: A qualitative investigation guided by phenomenology of practice.

Method: Parents of children who had experiential knowledge of parenting a child with developmental dysplasia of the hip participated in semi-structured interviews about their parenting experiences. Interviews included questions about the influence of physiotherapist and other health professionals on their experience. Interview transcripts were transcribed verbatim and analysed thematically.

Results: Caring for a child with hip dysplasia burdened parents with additional stressors that detracted from the practice of parenting. These stressors included confusion communication, dealing with the unknown and adjusting to an infant with a long-term health issue. Parents' reported needing to cede the clinical advocacy for their child to trusted health professionals, often physiotherapists, in order to focus on the practice of parenting.

Conclusions: Physiotherapists are in a critical position to influence parents' experiences through empathetic communication and effective liaison with other health professionals involved in the child's care.

Key Practice Points:

- The diagnosis and management of developmental dysplasia of the hip had a considerable impact on the practice of parenting.
- By understanding this parenting experience in-depth, physiotherapists are likely to be able to develop strategies to mitigate the negative aspects of this impact.

Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander People: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population. Although the experience of Aboriginal and Torres Strait Islander families is an area for future exploration.

## HEALTH, PHYSIOTHERAPY, THE FUTURE AND YOU

Ebert R, Fisher J, Locke M, Webb G



“The past cannot be changed. The future is yet in your power.” Anonymous.

Whether we like it or not Healthcare and Healthcare delivery is changing. New technologies, advances in drug development, genome sequencing, an aging population and budgetary considerations all contribute to the changing landscape of health. Have you ever wondered about the nature of your professional role in the future? Physiotherapy is a profession that is flexible and adaptive. Physiotherapists throughout the world are constantly creating new roles for themselves and the profession. What might physiotherapy look like in 10, 20 or 30 years? To answer this question, we have brought together four inspiring people, leaders in their field, to answer question about Healthcare and Healthcare delivery in the future and the role of physiotherapists in emerging healthcare landscapes. These ordinary people, who have achieved extraordinary things, will not only help us understand the changing nature of healthcare but will also reflect on attributes both personal and professional that enabled them to take an active role in defining their future. These discussions may help you recognise that, like them, you too have the skills and attributes to achieve your aspirations.

#### Key messages

- Physiotherapy has a future in Healthcare delivery
- Physiotherapy is a profession that allows therapists to be flexible and adaptive and create new roles in a changing healthcare environment
- Physiotherapists have the attributes to be able to achieve their aspirations

## PHYSICAL ACTIVITY IN INOPERABLE LUNG CANCER

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**Aims:** 1) to analyse the physical activity (PA) of participants recruited to an RCT upon commencing treatment; and in the usual care (UC) group only to 2) identify baseline participant characteristics associated with higher PA levels at six months and 3) explore whether baseline PA levels were predictive of improved physical function and patient-reported outcomes at six-months.

**Method:** assessor-blinded RCT. The intervention (IG) comprised eight weeks of exercise, behaviour change and symptom management. Outcomes, assessed at baseline, nine weeks and six months, included PA (7-days of accelerometry), six-minute walk distance, strength, symptoms and health-related quality of life (HRQoL).

**Results:** 92 participants were randomised (45 IG, 47 UC). 80 completed baseline accelerometry (39 IG, 41 UC), characteristics: mean(SD) age 63.0 (12.3) years, 56% male, 51% stage IV disease. Baseline PA levels: median(IQR) steps/day 2859.6 (2034.0-3849.2) IG versus 3195.2 (2161.2-4839.0) UC. Lower baseline PA was associated with cachexia ( $p=0.06$ ). Between-group change score (steps/day) mean differences (95% CI) at nine weeks (174.5 (-1504.7 to 1853.7),  $p=0.84$ ) and six months (574.0 (-1162.3 to 2310.3),  $p=0.52$ ). UC daily steps ( $n=27$ , six months) was associated with age ( $\rho=-0.44$ ,  $p=0.02$ ). Associations between UC baseline daily steps and six-month outcomes were weak and only significant for HRQoL ( $\rho=0.41$ ,  $p=0.03$ ).

**Conclusion:** PA levels did not change significantly over six months. Participants with higher PA levels at baseline had improved follow-up HRQoL.

#### Key Practice Points:

- PA levels are low in people with inoperable lung cancer.
- Further research is required to identify participants who will benefit the most from PA interventions.



## ADVANCING THE CONVERSATION: EMPOWERING PHYSIOTHERAPISTS TO PROVIDE ACCESSIBLE AND EQUITABLE CARE FOR DIVERSE GROUPS OF PEOPLE

Edwards C, Kelly D, Setchell J

As physiotherapists it is important to develop meaningful relationships with our clients and communities to ensure we achieve the best possible health outcomes. For this to occur our care needs to be provided in a manner which is safe and comfortable. Whether a person is receiving safe care can only be determined by the individual and will be influenced by their culture and previous experiences. When working with diverse groups of people it is vital we have the skills and knowledge to be able to adapt our practice to ensure we're providing safe care for all our clients.

In this session speakers will share their experiences of working with Aboriginal and Torres Strait Islander peoples, the LGBTIQ+ community and those who have suffered torture and trauma. You will develop a greater understanding of the factors impacting on the health outcomes of these populations and learn ways to further engage with these communities.

### “I DIDN'T WAIT FOR THEM TO SAY GO”: PHYSICAL ACTIVITY PARTICIPATION THREE TO FIVE YEARS AFTER MAJOR TRAUMA

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**Aim:** Persistent disability following traumatic injuries can significantly restrict physical activity participation. The extent and long-term impacts of restricted physical activity on trauma survivors are unknown. This study aimed to explore trauma survivors' perceptions of physical activity participation, barriers, enablers and impacts within five years of injury.

**Design:** Longitudinal qualitative study

**Methods:** Sixty-six seriously injured adults (>16 years) were interviewed three years, four years (n=63) and five years (n=57) post-injury. A longitudinal thematic analysis was performed.

**Results:** Despite wanting to be physically active, many participants experienced significant, long-term physical activity restriction post-injury, which persisted over time. Restrictions were often related to a fear of re-injury or of exacerbating pain and fatigue levels. These restrictions were a source of distress and frustration for many participants given the perceived impacts on their social lives, family roles, and enjoyment of life. Participants were also concerned about weight gain and reduced physical fitness. Participants valued the support of insurers and specialised services in facilitating access to modified activities, such as clinical Pilates and hydrotherapy. Many participants also recognised the importance of adaptation, goal-setting, self-motivation and determination to be physically active despite limitations.

**Conclusion:** Survivors of traumatic injury experienced significant and persistent physical activity restriction post-injury. Concerns about health decline were common.

#### Key Practice Points:

- Physiotherapists could facilitate physical activity participation post-injury by assisting with goal setting and motivational strategies.
- Personalised services that address specific limitations and funding to enable access to modified activities could promote physical activity participation following traumatic injury.

## PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR SIX MONTHS AFTER MUSCULOSKELETAL TRAUMA: WHAT FACTORS PREDICT RECOVERY?

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**Aim:** There has been no device-based assessment of activity recovery in working-age adults with fractures. We aimed to measure sedentary behaviour and physical activity two-weeks and six-months following fracture, and determine associated factors.

**Design:** Cohort study

**Method:** Two-weeks and six-months post-fracture, 83 adults aged 18-69 with upper-limb (UL) or lower-limb (LL) fractures wore ActiGraph and activPAL accelerometers for ten days. We calculated sitting time, steps, and moderate-intensity physical activity (MPA), and conducted linear mixed-effects multivariable regression analyses to determine factors associated with temporal changes in activity.

**Results:** Participants with LL fractures sat two hours more ( $p<0.001$ ), took 66% fewer steps ( $p<0.001$ ) and engaged in 77% less MPA ( $p<0.001$ ) than participants with UL fractures. For sitting time, steps and MPA, greater improvement over time was observed for: young and middle-aged participants ( $p=0.01$ ); and those with LL fractures ( $p<0.001$ ).

**Conclusion:** Despite expected recovery six months post-fracture, participants with LL fractures still had lower levels of physical activity, relative to those with UL fractures. Older adults showed less improvement over time, suggesting they are an important target group for interventions aimed at regaining pre-injury activity levels.

**Key Practice Points:**

- This study demonstrated excessive, prolonged bouts of sitting and low physical activity levels following fracture
- Advice about rest could be supplemented with advice about breaking up prolonged sitting with standing, stepping and light activity bouts
- Physical activity interventions should be considered an integral part of trauma rehabilitation, recognising that a lack of clinical deficits may not mark the endpoint of recovery

## LOCAL SOLUTIONS FOR LOCAL PROBLEMS: IMPLEMENTING A GLOBAL SEDENTARY BEHAVIOUR INTERVENTION IN A LOCAL SETTING

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**Aim:** The 'End-PJ-Paralysis' movement is tackling in-hospital sedentary behaviour on a global scale. We aimed to investigate factors influencing the implementation of a multi-faceted sedentary behaviour intervention on Geriatric Evaluation and Management (GEM) wards at a Victorian hospital.

**Design:** The Institute for Healthcare Improvement's Model for Improvement was followed

**Method:** As part of a state-wide implementation, the End-PJ-Paralysis initiative, aimed at getting patients 'up, dressed and moving', was implemented on four GEM wards at a Victorian Hospital ( $n=129$  patients). A series of Plan-Do-Study-Act (PDSA) cycles were used to identify barriers to implementation and to evaluate the feasibility of solutions. Monthly planning and evaluation sessions included staff, patients and caregivers from participating wards and from across the state.

Results: A range of barriers to implementation were identified, including patients lacking clothes, wards lacking laundry facilities, staffing 'silos', and a falls-risk averse culture. Solutions that proved feasible included setting up a 'pop-up op-shop' to provide clothing, engaging volunteers to walk with patients, providing visual cues to patients about walking distances, and educating staff and patients via daily display of patient mobility data. Solutions that proved unfeasible included using pedometers to patients.

Conclusion: A collaborative approach which specifically addressed local problems proved successful in identifying feasible strategies for implementing a multi-faceted sedentary behaviour intervention.

Key Practice Points:

- Sedentary behaviour in hospitals is a complex problem requiring innovative, multi-modal solutions
- Physiotherapists must work in conjunction with hospital administrators, staff and patients to tackle these complex problems and engage local staff in their solutions.

## IS STEP COUNT AN ACCURATE INDICATOR OF INTENSITY OF PHYSICAL ACTIVITY IN PEOPLE WITH PARKINSON'S DISEASE?

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Aim: Participation in moderate-to-vigorous physical activity may have physical, psychological and neuroprotective benefits for people with Parkinson's disease. This study aimed to evaluate whether a simple measure of daily step count could provide a valid indication of physical activity intensity for people with Parkinson's disease.

Design: An observational, concurrent, validity study.

Method: Nineteen people with mild to moderate idiopathic Parkinson's disease (37% female, 63 ± 8.6 years) wore an accelerometer-based step count monitor (ActivPAL™) for 7 consecutive days. To estimate moderate-to-vigorous physical activity and inactive time the Multimedia Activity Recall for Children and Adults was also completed.

Results: The correlation between moderate-to-vigorous physical activity and total step count was not significant ( $r = 0.366$ ,  $p = 0.149$ ). Greater time spent in activity bouts of 41-300 steps was moderately correlated with moderate-to-vigorous physical activity ( $r = 0.493$ ,  $p = 0.044$ ) and the only step count measure that was significantly associated.

Conclusion: Total daily step count alone may not be a valid indicator of physical activity intensity in people with Parkinson's disease. Though time spent in stepping bouts with higher step counts may be a more accurate reflection.

Key Practice Points:

- Though simple to capture, step count alone is not an accurate measure of physical activity intensity in people with Parkinson's disease.
- Due to the benefits of physical activity in this population, more accurate, clinically acceptable measures of activity intensity need to be explored.
- Capturing intensity of physical activity achieved through activities other than stepping appears significant in this population.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research provides information to understand measurement of physical activity in Parkinson's disease. While not specific for Aboriginal and Torres Strait Islander people, results may be applicable but would require further population-specific studies.

## ADVANCED MUSCULOSKELETAL PHYSIOTHERAPY POST-OPERATIVE NEUROSURGERY SERVICE: A NOVEL APPROACH TO MANAGING CLINIC DEMAND

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**Aim:** To describe the characteristics and outcomes of patients attending the Advanced Musculoskeletal Physiotherapy post-operative neurosurgery service and assess any related adverse outcomes.

**Design:** Retrospective audit

**Method:** Clinical records of patients attending the Advanced Musculoskeletal Physiotherapy post-operative neurosurgery service were audited from October 2018-April 2019. Demographic, appointment and surgery data was analysed, as well as patient outcomes (discharged with or without further follow up; further review required). Adverse outcomes (eg, missed diagnosis) were assessed.

**Results:** Overall 67 patients (57% female; n=38; median age 60 years; range 17-90) were reviewed in the AMP clinic. Patients underwent one of three operations: Anterior Cervical Decompression and Fusion (n=14, 21%), lumbar microdiscectomies (n=24; 36%) or single or multi-level lumbar laminectomies (n=29, 43%). Overall 61% of patients (n=41) were discharged directly from the clinic. Onward physiotherapy referral was arranged for 11 (16%), predominantly patients following lumbar laminectomy. Neurosurgical review was arranged for 25% (n=17) for the following reasons: new or worsening symptoms post-operatively (n=4; 6% of total), no improvement with surgery (n=8; 12%) or routine review to assess fusion (n=5; 7%). Review in the Advanced Musculoskeletal Physiotherapy clinic was arranged for six (9%) patients with slow improvement. No adverse outcomes related to the clinic were identified.

**Conclusion:** Advanced Musculoskeletal Physiotherapists can safely and effectively manage select neurosurgical post-operative patients, escalating care to the neurosurgical team when required.

**Key Practice Points:**

- Advanced Musculoskeletal Physiotherapists can safely and effectively review select post-operative neurosurgery patients.
- Few of these patients require ongoing physiotherapy management.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research is not expected to impact Aboriginal and Torres Strait Islander people differently to other populations.

## WHAT IS THE EFFECTIVENESS OF NON-PHARMACOLOGICAL INTERVENTIONS FOR THE MANAGEMENT OF INDIVIDUALS WITH PERSISTENT ACROMIOCLAVICULAR JOINT OSTEOARTHRITIS? A SYSTEMATIC REVIEW

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**Aim:** (1) To investigate the individual and combined effectiveness of non-pharmacological interventions in individuals with persistent acromioclavicular joint osteoarthritis; (2) to investigate the comparative effectiveness of non-pharmacological versus surgical interventions, and (3) to identify the criteria used for defining failure of conservative interventions in individuals who require surgery for persistent acromioclavicular joint osteoarthritis.

**Design:** Systematic review.

**Method:** Studies were included if they contained adults aged 16 years or older and who were diagnosed both clinically and radiologically with isolated acromioclavicular joint osteoarthritis for at least three months or more. The studies included had to explicitly state the type and duration of conservative interventions trialed.

**Results:** No studies investigated the effectiveness of non-pharmacological interventions or compared them with surgical interventions. Ten surgical studies were included for final synthesis. From the included studies, the most common non-pharmacological interventions trialed were activity modification (n = 8) and physiotherapy (n = 4). Commonly the timeframe used to define failure of conservative management was four to six months (range, 3 - 12 months).

**Conclusion:** Currently there is no evidence to guide physiotherapists about the individual or combined effectiveness of non-pharmacological interventions for individuals with persistent acromioclavicular joint osteoarthritis.

**Key Practice Points:**

- Further research is needed to investigate the effectiveness of non-pharmacological interventions in individuals with isolated acromioclavicular joint osteoarthritis.
- Lack of evidence is not the same as evidence suggesting interventions are not effective; therefore physiotherapists should use their clinical reasoning skills to guide the management of individuals with isolated acromioclavicular joint osteoarthritis.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:**

The results of this review are relevant to all Aboriginal and Torres Strait Islander people whom have persistent acromioclavicular joint osteoarthritis.

## A COMPLEX RELATIONSHIP EXISTS BETWEEN GLUTEAL TENDON RECONSTRUCTION OUTCOMES, PAIN AND COMORBIDITIES

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**Aim:** To determine if gluteal tendon reconstructive (GTR) surgery provides patients with equivalent functional ability as a healthy age and sex matched group.

**Design:** Cohort comparison trial.

**Methods:** Thirty-six GTR patients were recruited from a single surgeon. Exclusion criteria was surgery < 12 months ago or a recent pelvic or lower limb fracture. Thirty age and sex matched comparison group participants were recruited. Exclusion criteria for this group included pain levels of >3/10 in the lower limb or back or a history of lower limb or back surgery.

Primary outcome measures were VISA-G, modified Harris Hip Score, Intermittent and Constant Osteoarthritis Pain score, Assessment of Quality of Life, 6-minute walk test, gait speed, stair ascend/descend, 30s sit to stand, and Timed Up and Go. Covariate measures were Body Mass Index, comorbidities, pain (visual analogue scale), and abduction strength.

**Results:** People who had a gluteal tendon reconstruction had poorer quality of life (-0.112; p < 0.000), walked a shorter distance (6MWT -10.5; p < 0.000), had slower gait speed (-0.23; p = 0.001), Timed Up and Go (2.2; p = 0.001) and fewer sit to stands (5.0; p = 0.000).

The number of comorbidities a participant had, had a clinically important impact on Quality of Life (-0.04; p ≤ 0.001) and 6MWT (-38.48; p ≤ 0.001). Pain negatively affected Quality of Life (-0.04; p ≤ 0.001).

**Conclusion:** A complex relationship exists between GTR outcomes and comorbidities.

**Key Practice Points:**

- Clinicians should attend to patient's comorbidities to optimise outcomes.

## VISA-G, HARRIS HIP SCORE AND OXFORD HIP SCORE: RESPONSIVENESS AND MINIMALLY IMPORTANT CHANGE IN GLUTEAL TENDON RECONSTRUCTIVE SURGERY PATIENTS

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**Aim:** To compare the responsiveness of the VISA-G, Oxford Hip Score (OHS) and modified Harris hip scores (mHHS) in patients undergoing gluteal tendon reconstruction (GTR).

**Design:** Prospective case series.

**Methods:** 56 GTR patients were evaluated pre-surgery and at 3, 6 and 12 months post-operatively using the VISA-G, OHS, the mHHS, and the Global Rating of Change (GRC) scale. Each outcome was evaluated for ceiling effects (% maximum score); minimal clinically important change (MIC) at  $\geq 3$  and  $\geq 4$  on the GRC; and internal and external responsiveness (Pearson's R), effect size and Standardized Response Mean.

**Results:** Ceiling effects were present at 12 months post-surgery for the mHHS (18/56, 32.1%) and OHS (13/56, 23.2%), but not for the VISA-G (1/56, 1.8%). The MIC for the VISA-G ranged from 22/100 to 29/100; the OHS from 12/48 to 16/48; and the mHHS from 28/91 to 29/91. All measures demonstrated similar levels of responsiveness (95% CIs) for both Effect Size and Standardized Response Mean (SRM).

At 12 months post-surgery, the correlation between the change scores for VISA-G and mHHS was 0.520 (95% CI: 0.298-0.689), and 0.637 (95% CI: 0.449-0.771).for OHS.

**Conclusion:** The VISA-G was more resistant to a ceiling effect than the OHS or the mHHS. The VISA-G, OHS and mHHS are equally responsive and change scores correlate similarly with perceived improvement in this population.

**Key Practice Points:**

In patients undergoing GTR:

- The VISA-G is more resistant to ceiling effect than OHS and mHHS
- The VISA-G, OHS and mHHS have similar responsiveness.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** These commonly used hip outcomes scores are yet to be trialled on an Aboriginal and Torres Strait Islander population.

## A PROGRAM COMPRISING SERIAL CASTING, BOTULINUM TOXIN, SPLINTING AND MOTOR TRAINING IS EFFECTIVE IN MANAGING SEVERE CONTRACTURES: RANDOMISED CONTROLLED TRIAL

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**Aim:** To determine the effectiveness of a program combining serial casting, botulinum toxin, splinting and motor training on contracture management.

**Design:** A randomized controlled trial with concealed allocation, assessor blinding and a deferred treatment crossover design within the control group.

**Method:** Thirteen ankles with severe contractures were included in the study. The intervention group received botulinum toxin followed by serial casting, then splinting and motor training. The control group was placed on a wait list for six weeks (control phase) and then received the same interventions as the intervention group (intervention phase).



The primary outcome was passive ankle dorsiflexion range. Secondary outcomes included spasticity, ankle dorsiflexor strength, Functional Independence Measure score for walking item and walking speed.

Results: The mean between-group difference for passive ankle dorsiflexion range was 26° (95% CI: 17 to 35) at completion of casting; the effect was maintained at Week 2 post casting. The mean within-group difference for passive ankle dorsiflexion range was 26° (95% CI: 20 to 31) at completion of casting. The effect was maintained at Week 2 and Week 8 post casting and at discharge.

Conclusion: A multimodal approach for contracture management comprising serial casting, botulinum toxin, splinting and motor training can be useful in improving joint range.

Key Practice Points:

- Passive stretch can improve joint range when it is applied at a large dose and in conjunction with interventions that address the contributors to contracture
- Clinicians may consider using a similar approach or the same program to correct contractures

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:

The results of this research are likely to have the same impact on the Aboriginal and Torres Strait Islander population as that of the non-indigenous population.

## PEOPLE WITH CANCER PERCEIVE A BENEFIT FROM EXERCISING WITH PHYSIOTHERAPISTS, BUT WANT MORE SUPPORT TO TRANSITION BACK TO THE COMMUNITY

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Aim: This study aims to explore the benefits, challenges, barriers and facilitators experienced by people with cancer who have participated in a hospital-based exercise program.

Design: Qualitative study.

Methods: This study involved a qualitative analysis of data following a phenomenological design. Fifteen people with a cancer diagnosis who participated in a hospital-based exercise program at a tertiary hospital were purposefully recruited for this study. Semi-structured interviews were conducted and thematic analysis was employed to identify emergent themes.

Results: Perceived benefits of exercise was the most prominent theme to emerge, with the majority of program completers (n=11) and non-completers (n=4) recognising improvements in physical, mental and/or social well-being. Overcoming treatment-related fatigue presented as the greatest challenge, particularly among non-completers. Many participants highlighted the support from staff and peers as the greatest facilitator to participation. The transition from a supervised environment to everyday life presented as the most significant barrier to exercise beyond the program among both groups.

Conclusions: Most people with cancer perceived a number of physical, mental, and social benefits of exercise. However, survivors perceived difficulty with adherence to exercise beyond the completion of the program despite program completion or drop-out.

Key Practice Points:

- Physiotherapists should pursue supervised interventions as well as facilitate transition to exercise in the community to enhance adherence to exercise long-term in cancer survivors.

- Fatigue is perceived as a barrier to exercise, however exercise is the best evidence-based treatment for cancer-related fatigue. Physiotherapists have a key role in educating patients regarding this.

## HIGHER PHYSICAL ACTIVITY IS ASSOCIATED WITH LOWER CARDIOVASCULAR RISK AT TWO YEARS FOLLOWING DISCHARGE FROM STROKE REHABILITATION

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**Aim:** Understanding the associations between physical activity and cardiovascular risk in stroke survivors could be useful for developing effective treatments to prevent recurrent stroke. This study aimed to determine the relationship between physical activity and cardiovascular risk factors over two years following stroke rehabilitation discharge.

**Design:** Longitudinal observational study.

**Methods:** Primary stroke survivors were evaluated at rehabilitation discharge, six, 12 and 24 months later. Moderate to vigorous physical activity duration (minutes/day) assessed with the Sensewear Armband was the primary outcome. Further outcomes included the number and duration of moderate-vigorous physical activity bouts, number and duration of sedentary bouts and cardiovascular risk factors (blood pressure, fasting lipid profile, body mass index). Associations between physical activity and cardiovascular risk factors over time were assessed with random effects regression modelling.

**Results:** Fifty-seven participants (19 female) with a mean age 65 [SD 14] and median gait speed 1.2m/s (IQR 0.8,1.4) were included.

Strong associations were found between; higher physical activity (moderate-vigorous physical activity duration, number and duration of moderate-vigorous physical activity bouts) and lower body mass index (all  $p \leq 0.001$ ); higher physical activity (number and duration of moderate-vigorous bouts) and higher HDL cholesterol (all  $p \leq 0.04$ ); and lower sedentary bout duration and lower body mass index ( $p = 0.02$ ).

**Conclusions/Key Practice Points:**

- Bouts of moderate-vigorous physical activity and sedentary behaviour are associated with HDL cholesterol and body mass index.
- Increasing bouts of moderate-vigorous physical activity and breaking up sitting time may be valuable treatment goals to reduce cardiovascular risk in stroke survivors.

## STROKE SURVIVORS DEMONSTRATE DECREASED ADHERENCE TO STROKE RISK FACTOR RECOMMENDATIONS TWO YEARS POST REHABILITATION DISCHARGE

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**Aim:** To date no studies have objectively measured physical activity for more than 12 months following stroke. This study aims to investigate whether stroke survivors meet physical activity and cardiovascular risk recommendations over the two years following rehabilitation discharge.

**Design:** Longitudinal observational study.

**Methods:** First ever stroke survivors admitted to a large metropolitan rehabilitation hospital were recruited. Outcomes were measured at rehabilitation discharge, six, 12 and 24 months later. Outcomes were physical activity measured by the Sensewear Armband (moderate-vigorous physical activity, steps/day) and cardiovascular risk factors (blood pressure, fasting lipid profile, waist circumference, body mass index). Changes over time were evaluated with random effects regression modelling.



Results: Participants (n=57, 33% female) had mean age 65 [SD 14] years and median gait speed 1.2m/s (IQR 0.8,1.4). Physical activity levels did not change significantly over time. Many participants achieved the recommended 30 minutes of daily moderate-vigorous physical activity at baseline, however this decreased at two years (72% (57/79) versus 65% (37/57), p=0.05). Adherence to cardiovascular recommendations decreased over time. Waist circumference and body mass index increased (by mean 3.2cm and 1.2 kg.m2 respectively, p<0.01). Systolic blood pressure and total cholesterol increased and at 24 months were higher than baseline (by 2.7mmHg, p=0.05 and 0.24mmol/L, p=0.06).

#### Conclusions/Key Practice Points:

- Adherence to physical activity and cardiovascular recommendations decreases over time post stroke
- Stroke survivors could benefit from annual multi-disciplinary review to identify increasing risk and initiate appropriate interventions
- This is the largest longitudinal study of objectively measured physical activity following stroke

## HOME-BASED EXERCISE IMPROVES MOBILITY AND BALANCE IN PARKINSON'S DISEASE AND IS NOT INFERIOR TO CENTRE-BASED EXERCISE: A SYSTEMATIC REVIEW

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Aim: To determine, in people with Parkinson's disease, if predominately home-based exercise is: 1) effective compared to control intervention and 2) as effective as centre-based exercise.

Design: Systematic review and meta-analysis of randomised and quasi randomised control trials. PROSPERO: CRD 42018107331

Method: Databases and articles were searched for trials comparing predominately home-based (greater than two-thirds) exercise to either a control intervention (e.g. usual care or placebo) or to an equivalent, centre-based exercise intervention for adults with Parkinson's disease. The exercise had to target gait and/or standing balance. Primary outcomes were mobility and/or balance and secondary outcomes were gait and quality of life.

Results: Sixteen good quality trials were included in the meta-analysis. As different outcome measures were used data was pooled using standardised mean difference (SMD). There was a significant improvement in mobility and/or balance (SMD: 0.21, 95% CI 0.09 to 0.32), and gait speed (SMD: 0.30, 95% CI 0.12 to 0.49) immediately after home-based exercise and quality of life was improved beyond the intervention period (SMD: 0.23, 95% CI 0.06 to 0.39). There was no difference between home-based exercise and centre-based exercise for any outcome.

Conclusion: Home-based exercise improves mobility and balance, and gait speed in people with Parkinson's disease, and these improvements are likely to be similar in magnitude to improvements with equivalent centre-based exercise.

#### Key Practice Points:

- Home-based exercise is effective in improving mobility in people with Parkinson's disease.
- Home-based exercise is not inferior to equivalent centre-based exercise.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research isn't specific for Aboriginal and Torres Strait Islander people and therefore improved results in this population are not expected.

## THAI VERSION OF THE MOORONG SELF-EFFICACY SCALE: PSYCHOMETRIC STUDY AMONG INDIVIDUALS WITH SPINAL CORD INJURY

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Self-efficacy can be measured by different scales. Many measurements were developed to assess self-efficacy. Moorong Self-Efficacy Scale (MSES) was developed and validated to assess self-efficacy in individuals with spinal cord injury (SCI).

**Purpose:** To translate and cross-cultural adaptation of the Moorong Self-Efficacy Scale (MSES) in Thai individuals with SCI and investigate psychometric properties of the Thai version of the MSES (Thai MSES) for use in individuals with SCI.

**Methods:** Six stages of cross-cultural adaptation were conducted as follows: (1) forward translation, (2) reconciliation, (3) backward translation, (4) independent reviews, (5) finalization process, and (6) testing of translations. Sixteen items were translated into Thai. Thai translated version was tested by 23 individuals with SCI. Data was analyzed by qualitative analysis. The psychometric properties (content validity, convergent validity, test-retest reliability, internal consistency, SEM, and MDC) of the Thai MSES was examined.

**Results:** for translations and independent reviews, modifications were made at items 2 and 6 and some words were changed to lay language. The percentage of overall acceptable meaning of the Thai translated version was 91% (ranging from 78% to 100%). The content validity index (CVI) of the Thai MSES was 1.00. The Cronbach's alpha coefficient was 0.921. There was no correlation between Thai MSES score and each domain of Thai SF-36V2. The ICC 2,1 value for total was 0.82, SEM was 7.78 and MDC was 21.57.

**Conclusions:** The MSES was cross-culturally adapted to Thai. Two items were adapted for greater understanding. Its measurement properties demonstrated acceptable internal consistency and good test-retest reliability.

## PELVIC ORGAN PROLAPSE SYMPTOMS IN WOMEN WHO LIFT HEAVY WEIGHTS FOR EXERCISE: A CROSS-SECTIONAL SURVEY

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**Aim:** To determine the prevalence of symptomatic pelvic organ prolapse and associated risk factors in women who do not lift weight for exercise and those who lift light, moderate and heavy weights.

**Design:** A cross-sectional, survey study.

**Method:** Women completed an online survey regarding physical activity, pelvic floor symptoms and risk factors for pelvic floor dysfunction. The question of a vaginal bulge sensation was used to signify symptomatic pelvic organ prolapse. Relationships between symptoms and risk factors were assessed through logistic regression analysis.

**Results:** Of the 3934 survey participants, the total prevalence of symptomatic prolapse was 14.4%. Physically active women lifting less than 15 kg were more likely to report symptomatic prolapse compared to women lifting greater than 50 kg (OR 2.12, 95% CI 1.63 to 2.76,  $p < 0.001$ ). Age, vaginal parity, history of constipation and/or haemorrhoids, and family history of prolapse were significantly associated with symptoms. There was no relationship between symptomatic prolapse and body mass index, forceps delivery, cesarean section, hysterectomy and menopausal status.

**Conclusion:** This research provides insight into the prevalence of symptomatic pelvic organ prolapse in women lifting heavy weights for exercise, which has not previously been studied. Advice on heavy weight lifting as a risk factor in the pathophysiology of pelvic organ prolapse requires further investigation.

#### Key Practice Points:

- Lifting heavier weights for exercise does not increase the likelihood that women will report symptomatic pelvic organ prolapse

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research isn't specific for Aboriginal and Torres Strait Islander people and therefore results may vary in this population.

## EXERCISE TRAINING IN PULMONARY HYPERTENSION: WHERE ARE WE UP TO?

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**Background and Aim:** Until twenty years ago exercise training was not recommended for pulmonary hypertension (PH) for fear that it may worsen right heart function and precipitate right heart failure. However over the past twenty years there have been a number human studies examining exercise training in PH. The aim of this presentation is to review the exercise training studies conducted to date and summarise the overall findings.

**Design and Methods:** The review will examine both controlled and non-controlled studies of exercise training studies in PH completed to date.

**Results:** There have now been over 15 human exercise training studies in PH reported in the literature. A recent Cochrane review(1) examined randomised controlled trials (RCT's) in PH reported substantial increases in exercise capacity and quality of life (n = 165, 5 randomised controlled trials). The mean increase in six minute walk distance (6MWD) in the exercise group over the control was 60.12 metres. Health related quality of life (short-form 36) also improved (physical component score was 4.63 points higher and the mental component score was 4.17 points higher in exercise group over the control). In this review only a single adverse event was reported (patient stopped exercise due to light-headedness). Overall the quality of the evidence for exercise training in PH remains low, with small number of participants. Many of the studies used an inpatient-based exercise program and a few studies have examined outpatient-based exercise training.

#### Conclusion and Practice Points:

- Whilst there has been an increase in the number of studies of exercise training in PH, these remain low quality.
- The results however are promising and in individuals with stable PH exercise appears safe and improves both 6MWD and quality of life.

## BEYOND THE DEFAULT A QUEST BECKONS...

Fox J

This keynote is designed to disrupt default thinking, getting people out of operational work-mode (and its fixation on the immediate), and into a mode that is far more open, curious and courageous—so that we might contemplate new possibilities beyond the default. In particular, you will be encouraged to reflect on your own thought patterns and behaviours, so that you are neither too complacent nor too cocksure.

**DISCOVER:** How default thinking may be creating a 'delusion of progress' (and what to do about it); how to cultivate the curiosity, empathy and quality thinking needed to stay relevant; and how to use a 'Quest-Augmented Strategy' to ensure meaningful progress.

## CLINICAL REASONING, DIAGNOSTIC DECISION MAKING, TERMINOLOGY AND REPORTING FOR PELVIC FLOOR DYSFUNCTION

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This topic will explore how pelvic floor physiotherapists can apply a diagnostic-decision making process, integrating clinical reasoning, into their assessment of patients presenting with pelvic floor disorders. The focus will be on assessment to determine if there is a neuromuscular component to the pelvic floor dysfunction. The clinical assessment process will be based on the International Continence Society framework and standardised terminology used for diagnosing pelvic floor dysfunction (symptoms, signs and investigations leading to diagnosis). Clinical utility of these assessment processes will be discussed. Together with the history and findings from non-neuromuscular assessment, the pelvic floor muscle assessment findings can inform diagnosis and direct appropriate treatment. Published checklists of exercise therapy and behavioural therapy strategies can enhance treatment planning and execution, and encourage clinicians to use standardised terminology when discussing treatment and response to treatment. Relevant checklists which can be applied to pelvic floor therapies will be discussed.

### Key Practice Points:

- increased familiarity with standardised terminology will assist clinicians and researchers to report assessment findings in a consistent way
- use of recognised reporting frameworks for treatment will clarify components of pelvic floor muscle therapies that have been used in treatment, encouraging application of evidence-based therapies into practice

## PELVIC FLOOR DISORDERS AND THE EXERCISING WOMAN

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The prevalence of pelvic floor disorders, especially urinary incontinence, in exercising women is common but under-reported and there are currently no clinical guidelines for management. Research reveals high prevalence rates of urinary incontinence in nulliparous and parous female athletes, especially those participating in repetitive, high-impact sports, although urinary incontinence also occurs in sub-elite and recreational exercisers. Research also points to the negative impact on quality of life and exercise participation in women experiencing symptoms of pelvic floor disorders. This presentation will explore the magnitude of the problem of pelvic floor disorders in exercising women (prevalence and impact) and our current understanding of how / why it happens. Differences between low, moderate and high impact on pelvic floor function and other risk factors for developing pelvic floor dysfunction will be explored. A summary of what is known will be presented and knowledge gaps which require further exploration will be highlighted. From what we currently know, potential management options will be presented.

### Key Practice Points:

- increased awareness of the prevalence of pelvic floor disorders in exercising women
- increased understanding of the pathophysiology of this problem.

## GYNAECOLOGICAL CANCER AND BREAST CANCER, EXERCISE AND PELVIC FLOOR FUNCTION

**Frawley H<sup>1</sup>**

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This presentation will focus on gynaecological cancer – the third most common cancer in women – and breast cancer – the most commonly diagnosed cancer in women – and the impacts of these cancers and their treatments on pelvic floor function in women. Recent evidence indicates women who have undergone treatment for gynaecological and breast cancers experience pelvic floor disorders, especially genito-urinary symptoms, at higher rates than community-dwelling women. The mechanisms for how surgical, radiotherapy, chemotherapy and endocrine therapies impact on bladder, bowel, sexual and pelvic floor muscle function will be discussed. Pelvic floor muscle therapies are recommended as first line interventions for pelvic floor disorders in women without cancer, yet little is known of how these therapies may affect pelvic floor and pelvic floor muscle function in women post-cancer treatment. Findings from observational and controlled trials will be discussed to provide an up-to-date summary of what is known in this area, understand how pelvic floor therapies may help, and to highlight current knowledge gaps which need to be addressed by future research. Both cancers also impact on women's physical activity levels and the evidence for both the impact and for effectiveness of general exercise will be presented. Despite the paucity of evidence, particularly for pelvic floor management, suggestions for current clinical practice based on existing evidence and knowledge will be presented. This may help clinicians offer women strategies to maximise general and pelvic floor health in their recovery from cancer and cancer treatments.

### Key Practice Points:

- current knowledge of the role of pelvic floor physiotherapy in the management of women following treatment of breast and gynaecological cancer

## CERVICAL SPINE MUSCULOSKELETAL IMPAIRMENTS IN SUBACUTE MILD TRAUMATIC BRAIN INJURY: NOT ROUTINELY IDENTIFIED BY SYMPTOM REPORTING OR NECK DISABILITY

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**Aim:** To determine whether cervical spine musculoskeletal impairments exists sub-acutely following mild Traumatic Brain Injury (mTBI), and whether impairments are related to self-reported symptoms or the Neck Disability Index (NDI).

**Design:** Observational study.

**Method:** Cervical spine kinematics, neuromuscular function and manual examination results were compared between 39 healthy controls, and 74 individuals 4-26 weeks post-mTBI. The overall mTBI group was sub-grouped based on 1) spontaneous self-report symptom measure (asymptomatic or symptomatic mTBI) and 2) NDI score (NDI  $\geq 10$ , NDI  $< 10$ ) for further between group comparisons using mixed methods analysis.

**Results:** Significantly impaired cervical range and velocity of movement were observed in the sagittal and transverse plane among the overall ( $p < 0.04$ ), symptomatic ( $p < 0.04$ ), and NDI  $\geq 10$  mTBI groups ( $p < 0.03$ ) compared to healthy controls. The asymptomatic mTBI group also demonstrated reduced range of motion in the transverse plane compared to healthy controls ( $p=0.03$ ). All mTBI sub/groups demonstrated reduced neck flexor endurance and a significantly higher proportion of positive findings of joint dysfunction on manual examination compared to the healthy control group ( $p < 0.05$ ).

**Conclusion:** Cervical musculoskeletal impairment is more likely post mTBI in those reporting persistent symptoms or those scoring  $\geq 10$  on the NDI, but may also be present in individuals reporting an absence of symptoms or NDI  $< 10$ .

### Key Practice Points:

Following mTBI:

- Cervical musculoskeletal impairment may exist which has implications for management.
- Clinicians should routinely examine the cervical spine.

- Cervical musculoskeletal impairment may exist even in the absence of symptom reporting.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research will improve the health outcomes of Aboriginal and Torres Strait Islander people who suffer a concussion.

## IMPROVING THE SELECTION OF PATIENTS FOR SURGERY WITH IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS BY USING MCIDS OF CLINICAL MEASURES

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**Aim:** To identify if minimally clinically important differences(MCIDs) for the timed up and go(TUG), performance orientated mobility assessment(Tinetti) and Berg balance scale(BBS) improve the diagnostic accuracy of the tap test(TT) to identify improvement post surgery for idiopathic normal pressure hydrocephalus(iNPH).

**Design:** Prospective observational study of 32 patients undergoing a TT for consideration of surgery for iNPH.

**Method:** MCIDs for the TUG (3.63 seconds), Tinetti(4 points) and BBS(4 points) were utilised to dichotomise patients. Patients were labelled responders if the change score improved by a minimum of the MCID following TT and again following surgery. Sensitivity, specificity, positive predictor values (PPV) and negative predictor values (NPV) for each measure were calculated.

**Results:** Utilising the MCIDs for each measure resulted in the following clinimetrics: TUG sensitivity= 58% specificity= 76% PPV= 67% NPV=68%, Tinetti sensitivity=63%, specificity=71%, PPV= 67% NPV=67% and for the BBS sensitivity=88%, sensitivity= 69%, PPV=75% NPV=85%.

**Conclusion:** Dichotomising TT outcome by MCIDs of the above clinical measures can quantify improvement for the TUG, Tinetti and BBS resulting in substantial improvements on previously reported specificity (52%), sensitivity (59%) and NPV (18%) for the TT. The use of these MCID values will aid clinicians in determining if patients will improve from surgery for iNPH.

### Key Practice Points:

- MCIDs for the TUG, Tinetti and BBS significantly improve sensitivity, specificity, and NPV for the TT with respect to improvement from surgery in iNPH.
- MCIDs for the TUG, Tinetti and BBS can quantify improvement from a TT and reduce the number of patients undergoing surgery for iNPH who will not improve.

## CHANGES IN PERFORMANCE SCORES FOLLOWING A TAP TEST PREDICT IMPROVEMENT AFTER SURGERY FOR IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS.

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**Aim:** To identify if change scores for the timed up and go(TUG), performance orientated mobility assessment(Tinetti) and Berg balance scale(BBS) calculated following a CSF tap test(TT) can be used to predict surgical benefit for patients with idiopathic normal pressure hydrocephalus(iNPH).

**Design:** Prospective observational study of 32 patients undergoing a TT for consideration of surgery for iNPH.

**Method:** Patients were assessed with the TUG, Tinetti and BBS, before and after a TT, and on hospital discharge following shunt insertion surgery. Wilcoxon sign-rank tests, Spearman's correlation and linear regression modelling compared change scores for each measure. Significance levels were set at of 0.05.

Results: No significant differences were present between TT and surgical change scores for the TUG (1.5sec vs 2.11sec,  $p=0.85$ ) and Tinetti (3.5 vs 4 points,  $p=0.76$ ). For the BBS a significant difference was present (5.5 vs 4 points,  $p=0.04$ ). Spearman's correlation was significant for all measures, TUG( $r=0.48$ ,  $p=0.01$ ), Tinetti( $r=0.40$   $p=0.05$ ), BBS( $r=0.76$   $p<0.01$ ). Linear regression modelling demonstrated that TUG surgical change scores increased by 1.07 for each second of TT change score ( $R^2=0.73$ ,  $p<0.01$ ) and BBS surgical change score increased by 1.05 for each point of TT change score ( $R^2=0.58$ ,  $P<0.01$ ).

Conclusion: TT change scores for the TUG and BBS predict and are correlated to post surgery change scores. This may assist clinicians to determine if patients will benefit from undergoing surgery for iNPH.

Key Practice Points:

- TUG and BBS TT change scores can predict outcome post surgery.
- Further longitudinal research is required to confirm these findings implications for practice.

## DO PEOPLE WITH MINOR TO MODERATE INJURIES RETURN TO WORK WITHIN ONE MONTH OF A ROAD TRAFFIC CRASH?

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Aim: To determine the impact of minor to moderate injury resulting from a road traffic crash on various work outcomes.

Design: Prospective cohort study.

Method: Participants (18-64 years) injured in road traffic crashes were recruited from Townsville Hospital. Baseline data collection occurred <28 days post-crash. Outcomes included employment status, return to work date, work modifications, the Work Productivity and Activity Impairment questionnaire, and the Work Role Functioning questionnaire that assesses ability to meet work demands.

Results: Thirty-six participants have valid baseline data in this ongoing cohort study. Injuries sustained varied from an isolated toe injury to long bone fractures. Twenty-seven (75%) were employed prior to their crash. Of those, 18 (67%) had returned to work after on average four days post-crash. Work modifications (e.g. reducing physical demands) were made by eight of 18 (44%) participants. Seven of 17 (41%) participants felt their work productivity was substantially impaired ( $\geq 70\%$  impairment). Impaired work role functioning was also found (mean (SD) score 82.7 (22.5) where 100=no impairment).

Conclusions: Preliminary results from this ongoing study suggest individuals could return to work shortly after crash-related minor to moderate injury. However, some participants made modifications to their work, and felt their work productivity and functioning at work was negatively affected following their crash.

Key Practice Points:

- Physiotherapists should not use return to work status as a measure of complete recovery post-traffic crash.
- Physiotherapists should discuss possible work modifications with injured clients and their employers to promote recovery and facilitate early return to work.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:

The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.



## THE IMPACT OF MUSCULOSKELETAL INJURIES SUSTAINED IN ROAD TRAFFIC CRASHES ON WORK-RELATED OUTCOMES: A SYSTEMATIC REVIEW

**Gane E<sup>1,2,3,4</sup>**, Brakenridge C<sup>1</sup>, Smits E<sup>1</sup>, Aplin T<sup>1,2,5</sup>, Johnston V<sup>1</sup>

<sup>1</sup>RECOVER Injury Research Centre, The University Of Queensland, Brisbane, Australia, <sup>2</sup>School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia, <sup>3</sup>Physiotherapy Department, Princess Alexandra Hospital, Brisbane, Australia, <sup>4</sup>Centre for Functioning and Health Research, Metro South Health, Brisbane, Australia, <sup>5</sup>Speech Therapy Department, Prince Charles Hospital, Brisbane, Australia

**Aim:** To determine the impact of sustaining a musculoskeletal injury during a road traffic crash on a series of work-related outcomes.

**Design:** Systematic review.

**Method:** Observational studies were identified by searching six electronic databases for reports of adults with musculoskeletal injuries following a road traffic crash. To be eligible for inclusion, studies must have reported at least one of the following work-related outcomes: return to work status/rate; sick leave; work ability; work capacity; and health-related work productivity loss.

**Results:** The database search yielded 1937 results (682 duplicates). Review of 1255 title/abstracts and 143 full texts resulted in 61 papers being included in the final review. Forty-five papers (74%) report on cohorts of patients with whiplash-associated disorder. The most common outcome reported was return to work status. The majority of participants in the included cohorts had returned to work by 1 to 2 years post-crash. Very few studies reported on the other work-related outcomes; those that did reported evidence of sick leave utilisation following return to work, impaired work capacity and work ability in a proportion of participants.

**Conclusions:** Most people who sustain a musculoskeletal injury following road traffic crash return to work. However, for some people, this is not an indication of complete recovery.

**Key Practice Points:**

- Return to work is not an indicator of complete recovery in all people who sustain a musculoskeletal injury in a road traffic crash.
- Physiotherapists should continue to consider work ability, capacity and productivity in injured persons who have returned to work.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:**

The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## WHAT ARE THE ACTIVITY LEVELS OF PATIENTS ADMITTED TO REHABILITATION UNITS IN REGIONAL HOSPITALS?

**Garner J<sup>1,2</sup>**, Smith M<sup>2</sup>

<sup>1</sup>Charles Sturt University, Orange, Australia, <sup>2</sup>James Cook University, Townsville, Australia

**Aim:** To measure the physical, cognitive and social activity levels of patients admitted to rehabilitation units in regional areas. A secondary aim was to explore differences in activity levels across different diagnostic groups.

**Design:** An observational study using behavioural mapping was conducted in two inpatient general rehabilitation wards, at regional hospitals in NSW. Patient activity was mapped every 15 minutes, over a 12-hour period, on two, non-consecutive days. The percentage of the day spent in physical, cognitive or social activities was recorded. In addition, the patients' location and interacting personnel were recorded.



Results: Fifty-six participants across the following diagnostic groups were observed: stroke, brain injury, neurological, spinal cord injury, orthopaedic, reconditioning, pain and other. A total of 2285 observations were made. Patients were observed being active physically for 12.5% of their day, socially for 23.6%, and cognitively for 7.6% of their day. Patients were observed engaged in no-activity 29.3% of their day. There was no statistically significant difference between the diagnostic groups and activity categories. The majority of time patients were in their bedroom (74.9%) and alone (51.6%).

Conclusion: Patients can spend a large proportion of their time inactive and alone in rehabilitation. In order to maximise outcome, rehabilitation units can look at new opportunities to maximise activity and promote engagement. Enriching rehabilitation environments is an area for future study.

Key Practice Points:

- Opportunities exist to increase the amount of time patients in rehabilitation are engaged in physical, social and cognitive activity.

## HOW TO TREAT PELVIC/HIP DISSOCIATION IN NEUROLOGICAL PATIENTS

Garner J<sup>1,2</sup>, Levy T<sup>1</sup>, Fu C<sup>1</sup>

<sup>1</sup>Flinders University, Bed Ford Park, Australia, <sup>2</sup>Flinders Medical Centre, Bedford Park, Adelaide, Australia

Background: In neurological physiotherapy as clinicians we often struggle to treat patients who have poor pelvic/hip dissociation and as such may hitch their hip during swing phase of gait or posteriorly tilt their pelvis on the opposite side to initiate gait. This session will demonstrate three techniques to facilitate hip and pelvic dissociation during gait. Pelvic/hip dissociation is a difficult aspect of gait to treat. These techniques together with advance practice tips will aim to facilitate recovery.

Aims/objectives: Aim to show videos of before and after treatment techniques and how gait quality has improved per to post intervention.

Approach: Synopsis of x 2 patients and previous strategies attempted. Video of gait pre-treatment. Video of techniques used and then post video with patient perspectives.

Key Practice Points:

- The participants will be shown three techniques to address hip/pelvic dissociation and how to implement them and give as home exercise program.

## HOW ARE ROBOTIC EXOSKELETONS WITH TREADMILL TRAINING USED IN THE SUB- ACUTE NON AMBULANT STROKES POPULATION?- A SCOPING REVIEW

Garner J<sup>1</sup>

<sup>1</sup>Flinders University, Bed Ford Park, Australia, <sup>2</sup>Flinders Medical Centre, Bedford Park, Adelaide, Australia

AIM: to explore how robotic exoskeletons with treadmill training are used in the subacute non ambulant stroke population?

Design: A scoping review including all studies that used a robotic exoskeleton with treadmill as an intervention for non-ambulant subacute (< 6 months post stroke) stroke patients.

Method; data bases were searched using inclusion criteria-adults with a diagnosis of stroke< 6 months ago who scored 2 or less on the functional ambulatory category.

Results: 25 studies were included in the results. Each study had between 1-67 participants. The set-up, warm up sessions and intervention were heterogenous in terms of body weight support, speed, guidance force, number of sessions and duration of sessions.

Conclusion: There is heterogeneity in set up and intervention delivered to non- ambulant stroke participants. Future research should focus on developing procedures and exploring further the clinical reasoning process used to make these decisions in clinical practice

## WHAT ASPECTS OF GROSS MOTOR FUNCTION CAN LOWER LIMB MUSCLE STRENGTH PREDICT IN CHILDREN WITH SPINA BIFIDA MYELOMENINGOCELE?

Gehrig A<sup>1</sup>, Thomas N<sup>2</sup>, Johnston L<sup>1,2</sup>

<sup>1</sup>The University Of Queensland, Brisbane, Australia, <sup>2</sup>Children's Health Queensland Hospital & Health Service, Brisbane, Australia

Aim: To examine relationships between lower limb muscle strength and acquisition of gait and other gross motor skills in school-aged children with spina bifida myelomeningocele.

Methods: Thirteen children with myelomeningocele aged 4-12 years (mean 7 years, 8 months; SD 2 years, 8 months; 5 males) were recruited from a state-wide Spinal Disabilities service. Children were assessed using lower limb Manual Muscle Testing (MMT) and the Gross Motor Function Measure (GMFM-66). Relationships between muscle strength and gross motor skill acquisition were examined using frequency statistics and Spearman's Rank Correlations.

Results: Children with greater overall muscle strength on MMT showed better overall gross motor performance on the GMFM-66 ( $p < 0.05$ ). All children attained basic motor skills in supine, sit and 4-point kneel. Greater quadriceps strength was needed for reciprocal crawling ( $r = 0.992$ ). Greater hip muscle strength was needed for lower limb weight bearing ( $r = 0.605-0.992$ ). Greater strength in quadratus lumborum, abdominals and foot muscles was needed for independent walking ( $r = 0.586-0.788$ ). High-level balance skills such as hopping were only achieved by children with almost full muscle strength.

Conclusion: Lower limb MMT profiles can predict independent walking as well as other key gross motor skills in school-aged children with spina bifida myelomeningocele

Key Practice Points:

- Specific anti-gravity muscle strength patterns can predict acquisition of independent gait and specific gross motor skills in children with spina bifida
- Muscle strength should be measured regularly to better predict gross motor potential and improve goal setting for the spina bifida population.

## MANAGING MULTIMORBIDITY IN REHABILITATION: A THEMATIC ANALYSIS.

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<sup>1</sup>Australian Catholic University, Banyo, Australia, <sup>2</sup>Australian Catholic University, Melbourne, Australia, <sup>3</sup>Holmesglen Private Hospital, Moorabbin, Australia

Aim: To describe how multimorbidity is perceived and managed by healthcare professionals and patients in the inpatient rehabilitation phase of care.

Design: A qualitative study was conducted to facilitate complex analysis of participants' perceptions and experience of managing multiple chronic conditions during rehabilitation.

Method: Semi-structured interviews were conducted with five professional and five patient participants. Interviews were audio-recorded, transcribed and analysed using thematic analysis.

Results: Thematic analysis generated three key themes for each sample (Professionals and Patients). Professionals: 'complexity in motion', 'rehab is a team sport' and 'there's no place like home'. Patients: 'a gentle ungrowth', 'participant versus recipient' and 'resilience'.

Conclusion: Divergent perspectives emerged as the professionals viewed patients with multimorbidity as being more disadvantaged, whereas patients perceived themselves as being more resilient. Patients with multimorbidity were perceived by professionals to be complex, requiring more time and resources. Patients with multimorbidity did not comprehend their pathophysiology but understood their conditions through the resultant impairments and activity limitations affecting daily life. Home was considered the gold standard discharge destination by both samples. Multiple strategies for managing patients with multimorbidity were revealed: team-based rehabilitation, promoting resilience, functional language and goal setting, medication management, social supports, and streamlining the continuum of care.

Key Practice Points:

- Patients with multimorbidity may require more time and resource allocation to achieve outcomes.
- Rehabilitation may be enhanced for patients with multimorbidity by: promoting resilience to increase motivation, using functional language in goal setting, team-based rehabilitation approach, deprescribing medications and / or providing administration tools, confirming social supports, and providing comprehensive clinical handover between healthcare points.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: If consideration is given to the appropriate sociocultural factors of multimorbidity, this research may help enhance care for Aboriginal and Torres Strait Islander people.

## MANAGEMENT OF ANORECTAL DISORDERS: ASSESSMENT & COLLABORATIVE CARE IN THE ERA OF PRECISION MEDICINE

Gladman M<sup>1</sup>

<sup>1</sup>Specialist Colorectal & Pelvic Floor Centre, Adelaide, Australia

Anorectal disorders such as faecal incontinence and obstructed defaecation each affect approximately 10% of the adult community population. Traditionally, management of such disorders has adopted strategies which are applied empirically with minimal consideration for differences between individuals. Rapidly, this approach is being replaced by a model of care termed precision medicine where medical decisions, treatments and practices are tailored to individual patients based on new technologies.

In the 21st century, recent advances mean that anorectal function is now assessed using 3D hi-resolution anorectal manometry and 3D endoanal ultrasound. Accordingly, modern assessment yields sophisticated diagnostic information that allows patients to be classified into subpopulations that differ in their underlying pathophysiology. Such knowledge allows interventions to be focused on such abnormalities and provides opportunities for more effective collaborative care between clinicians, physiotherapists and other members of the allied health team.

This presentation will provide an update about new technologies for assessment of anorectal function; the application of such information to stratify patients into homogeneous subgroups based on pathophysiological abnormalities and how this can transform treatment strategies within the collaborative care team so that individual patients get the “optimal” treatment.

Key Practice Points: Participants will be able to:

- understand the results of contemporary techniques to evaluate anorectal function (3D hi-resolution anorectal manometry and 3D endoanal ultrasound)
- stratify patients into subgroups based on identified pathophysiology
- transform intervention to provide the optimal care for individuals rather than the commonest treatments for the “average patient”

## A VIDEO SELF-MODELLING VIRTUAL REALITY INTERVENTION FOR FREEZING OF GAIT IN PARKINSON'S DISEASE: A PROTOCOL FOR A PILOT TRIAL

Goh L<sup>1</sup>, Ahmadpour N<sup>2</sup>, Lewis S<sup>3</sup>, MacDougall H<sup>4</sup>, Ehgoetz Martens K<sup>3</sup>, Clemson L<sup>1</sup>, Allen N<sup>1</sup>, Sng J<sup>1</sup>, Canning C<sup>1</sup>

**Aim:** To determine the feasibility and acceptability of a video self-modelling intervention using an immersive virtual reality headset for managing freezing of gait in people with Parkinson's disease.

**Design:** A single group, mixed methods, ABA (baseline, intervention, post-intervention) pilot trial

**Method:** 12 participants with Parkinson's disease and freezing of gait will be recruited. A physiotherapist will assess participants in their homes to identify person-specific triggers for freezing of gait. 180-degree videos of participants performing their best movement strategies to overcome freezing of gait will be developed. Participants will watch their personal videos using a virtual reality headset, followed by physical practice of their personal strategies in their own homes. Six to eight home visits will be completed during the six weeks intervention period.

**Outcome measures:** Primary outcome measures include feasibility and acceptability of the intervention. Feasibility will be assessed by evaluating recruitment and retention rates, as well as adherence to the intervention and adverse events associated with the intervention. Acceptability will be assessed using the Modified Players Experience of Needs Satisfaction questionnaire and semi-structured interviews to explore participants' experience of the intervention. Secondary outcome measures include freezing of gait physical tests and questionnaires, Timed Up and Go Test, 10 m walk test, Goal Attainment Scale and Parkinson Anxiety Scale.

**Key Practice Points:**

- If shown to be feasible and acceptable, the potential for this intervention to reduce freezing of gait, improve mobility and reduce falls risk in people with Parkinson's disease will be explored in a randomised controlled trial.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research is not specific for Aboriginal and Torres Strait Islander people.

**Trial registration:** ACTRN12619000139178

## ALLIED HEALTH INTERVENTIONS FOR FREEZING OF GAIT IN PARKINSON'S DISEASE: A PROTOCOL FOR A SYSTEMATIC REVIEW AND META-ANALYSES

**Goh L<sup>1</sup>**, Allen N<sup>1</sup>, Song J<sup>1</sup>, Clemson L<sup>1</sup>, Canning C<sup>1</sup>

<sup>1</sup>Faculty of Health Sciences, The University Of Sydney, Lidcombe, Australia

**Aim:** The primary aim of this review is to determine whether allied health interventions reduce freezing of gait in people with Parkinson's disease in the short-term and long-term. Secondary aims are to determine whether allied health interventions targeting freezing of gait also improve gait, balance, falls, activities of daily living, and quality of life.

**Design:** Systematic review with meta-analyses

**Method:** Relevant trials from the Cochrane Library, MEDLINE, EMBASE, CINAHL, PEDro, OTSeeker and Scopus electronic databases will be identified. The search will include randomised controlled trials or randomised crossover trials of allied health interventions for adults with Parkinson's disease such as physiotherapy, occupational therapy, cognitive therapy, behavioural therapy, rehabilitation, exercise and gait training that reported freezing of gait as an outcome measure. Additional outcome measures including gait, balance, falls, activities of daily living and quality of life will also be examined. Meta-analyses structured around the type of interventions will be completed. If a meta-analysis cannot be completed due to insufficient data or high clinical heterogeneity, a narrative review will be completed. If data is available, subgroup analyses will be performed to examine if disease severity, presence of freezing of gait in participants

at baseline, amount of intervention, adherence to intervention and cognition of participants has any influence on outcomes.

**Key Practice Points:**

- Results from this review have the potential to guide physiotherapy clinical practice by identifying effective interventions to address freezing of gait in people with Parkinson's disease.

Protocol registration: PROSPERO 2018 CRD42018116820

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research is not specific for Aboriginal and Torres Strait Islander people.

## IMPACT OF HIGH INTENSITY INTERVAL TRAINING ON INCIDENTAL ACTIVITY IN ADULTS WITH METABOLIC SYNDROME: A RANDOMISED CONTROLLED TRIAL

**Gomersall S<sup>1,2</sup>**, Clark B<sup>3</sup>, Ramos J<sup>4</sup>, Keating S<sup>2</sup>, Fassett R<sup>2</sup>, Coombes J<sup>2</sup>

<sup>1</sup>The University of Queensland, School of Health and Rehabilitation Sciences, Brisbane, Australia, <sup>2</sup>The University of Queensland, School of Human Movement and Nutrition Sciences, Brisbane, Australia, <sup>3</sup>The University of Queensland, School of Public Health, Brisbane, Australia, <sup>4</sup>College of Nursing and Health Sciences, Flinders University, Adelaide, Australia

**Aim:** To examine changes in incidental activity with high intensity interval training (HIIT) compared with moderate intensity continuous training (MICT).

**Design:** Randomised controlled trial.

**Method:** Seventy-nine adults with metabolic syndrome were randomly allocated into one of three 16-week treadmill/cycling-based exercise interventions: 1HIIT (3 times/week of 1 x 4 min interval at 85-95% HRpeak; n=25); 4HIIT (3 times/week of 4 x 4 min intervals at 85-95% HRpeak; n=28) and MICT (5 times/week of 30 minutes at 60-70% HRpeak; n=26). Two sessions per week were supervised and no instructions about daily activity outside of the prescribed training were given. Time spent sitting, standing, in light and moderate to vigorous physical activity (MVPA) and steps were measured over 7 days using the activPAL3 accelerometer at baseline and end-intervention.

**Results:** From baseline to end-intervention, the MICT group significantly increased their steps/day (mean change  $\pm$  standard deviation: +1364 $\pm$ 810) compared with both the 1HIIT (+46 $\pm$ 777 steps/day) and 4HIIT groups (+142 $\pm$ 1327 steps/day). There were no significant between group differences for time spent sitting, standing or in light or moderate to vigorous intensity activity.

**Conclusion:** HIIT did not result in substantial changes to whole of day activity, while MICT significantly increased daily step count. This is largely commensurate with the higher training volume in the MICT group.

**Key Practice Points:**

- Although MICT resulted in larger changes in daily steps, activity was at least maintained and did not decrease with HIIT. When prescribing HIIT, a greater emphasis may need to be placed on habitual activity to optimise therapeutic benefits.

## A TEXT MESSAGE-ENHANCED CLINICAL EXERCISE REHABILITATION INTERVENTION FOR INCREASING 'WHOLE-OF-DAY' ACTIVITY IN PEOPLE LIVING WITH AND BEYOND CANCER

Eakin E<sup>1</sup>, Fjeldsoe B<sup>1</sup>, **Gomersall S<sup>1</sup>**, Healy G<sup>1</sup>, Skinner T<sup>1</sup>, Winkler E<sup>1</sup>

<sup>1</sup>The University of Queensland, Brisbane, Australia

**Aim:** To investigate the effect of an individually tailored text-messaging intervention focusing on whole-of-day activity behavior change both during and beyond a 4-week, supervised exercise clinic for cancer survivors.

**Design:** Randomised controlled trial.

Method: Clinic patients [n=36; age 64.8±9.6 years; time since treatment 46.0 (24.5, 61.0) months] were randomised to receive a standard (n=18) or enhanced (n=18) 4-week clinical exercise rehabilitation clinic. In addition to the standard clinic, the enhanced group received two face-to-face tailoring sessions (baseline and 4-weeks) and 12 weeks of tailored text messages focusing on physical activity and sedentary behaviour outside of the exercise classes. Time (min/16-h waking day) spent sitting, standing, and stepping at a light and moderate intensity were assessed using activPAL3. Group changes were compared (4-weeks and 12-weeks) using linear mixed models, adjusting for baseline values and potential confounders.

Results: Neither group showed a significant ( $p<0.05$ ) or large change in activity or use of time outside of the clinic over the first four weeks. By 12 weeks, relative to the standard group, the enhanced group improved significantly in time spent sitting (-48, 95% CI: -90, -6 min/16h day) and stepping at a light intensity (+7, 95%CI: 0.4, 14 min/16h) but not in standing (+42.1, 95%CI: -4, 88 min/16h day) or moderate-vigorous stepping (-2, 95% CI: -14, 9 min/16h day).

#### Key Practice Points:

- Tailored text messaging resulted in the replacement of sitting with light stepping, after the clinic ceased.
- Tailored text-messaging has potential to extend clinical contact and facilitate behavior change in this population.

## THE USE OF THE WEIGHT-BEARING LUNGE TEST IN A PAEDIATRIC CONGENITAL TALIPES EQUINOVARUS POPULATION

Gosse G<sup>1</sup>, Ward E<sup>1</sup>, Banwell H<sup>1</sup>, McIntyre A<sup>1,2</sup>

<sup>1</sup>University Of South Australia, Adelaide, Australia, <sup>2</sup>Women's and Children's Hospital, North Adelaide, Australia

Aim: The weight-bearing lunge test (WBLT) is commonly used to measure dorsiflexion range of motion. Loss of dorsiflexion range is one clinical sign in the relapse of congenital talipes equinovarus (CTEV). This study aimed to determine the reliability and validity of the WBLT, within a paediatric CTEV population.

Method: A reliability study was conducted examining the inter-reliability, intra-reliability and validity of a clinician, training clinician and parents/carers. Eligible participants with CTEV had their weight-bearing lunge measured twice in one session by each rater, conducted in a random order using three measures: distance from wall, iPhone Application and Digital Inclinator. Measurers were blinded to digital readings with a fourth researcher recording the digital degrees. A sample size of n=13 was required to obtain power of 0.8.

Results: Intra-reliability of distance measures for all raters were high with ICCs >0.955. Intra-rater reliability of the iPhone was good (ICCs > 0.751). Construct validity between the clinician's and parents distance measure was also high with 0.899.

Conclusion: The results demonstrate high to very high reliability and high construct validity, demonstrating this tool's usefulness in measuring dorsiflexion range in a CTEV population.

#### Key Practice Points:

- Clinicians can be confident in using WBLT to assess dorsiflexion range in a CTEV population using either distance, iPhone application or digital inclinometer.
- Given the construct validity, parents may use the WBLT for home-based monitoring to identify loss of dorsiflexion range early to improve relapse outcomes.

Proposed impact on Aboriginal and Torres Strait Islander people: Within Australia, the Aboriginal population experiences a greater prevalence of CTEV at 3.5/1000 livebirths compared to 1.1/1000 within a Caucasian population (Ansar et al 2018). By using this tool, we can encourage the use of self-management and monitoring for those populations living in remote communities who are unable to attend regular physiotherapy.



## RESPIRATORY MUSCLES: A FORGOTTEN TARGET FOR PHYSIOTHERAPY?

Gosselink R<sup>1,2</sup>

<sup>1</sup>Faculty of Movement and Rehabilitation Sciences, Department Rehabilitation Sciences KU , Leuven, Belgium, <sup>2</sup>Division of Intensive Care Medicine, University Hospitals , Leuven,

Respiratory muscle training was introduced in the 1970's, but did not receive the same attention as limb/trunk training in physiotherapy practice. Considerable research has since been published that substantiates the role of respiratory muscle dysfunction in patients with acute and chronic respiratory conditions, as well as musculoskeletal and neurological disorders. Exertional dyspnea, (nocturnal) hypoxemia, hypercapnia, ineffective cough, exercise impairment, impaired postural control and weaning failure are associated with respiratory muscle weakness or increased work of breathing. Insights from exercise and respiratory (patho-) physiology, with results from RCT's have broadened the horizon for respiratory muscle training. Furthermore, novel training modalities better allow optimal loading of the inspiratory muscles; such electronic devices allow recording of all training data (pressure, tidal volume, power) which is important to control the quality of what is often home-based training. Clinicians of multi-disciplinary backgrounds should be encouraged to consider the respiratory muscles as an important target for treatment in a variety of conditions. Training can affect clinical outcomes such as dyspnea, exercise performance, low back pain, respiratory infections, cough, and failed liberation from mechanical ventilation. The presentation will focus on the role of respiratory muscle dysfunction in the symptomatology, assessment of respiratory muscle strength and effects of training in a variety of conditions.

### Key Practice Points:

- Consider involvement of respiratory muscle weakness in the symptomatology of health conditions, specifically dyspnea, impaired cough, impaired exercise performance
- Assess respiratory muscle strength
- Consider respiratory muscle training when weakness is observed in combination with these symptoms

## A GLOBAL CONTRIBUTION TO PHYSIOTHERAPY: PASSION, PROBLEMS AND PERSEVERANCE

Gosselink R

Be prepared to be inspired. This interactive panel session will showcase the cardiorespiratory keynote and invited speakers beyond the cutting-edge research that they are presenting elsewhere on the program. Attendees will have the opportunity to ask questions and drive the discussion. Aside from publishing 150+ research papers, Professor Rik Gosselink has held eminent leadership roles within his university and professional societies. There is no doubt that his contribution to physiotherapy has impacted global physiotherapy practice. Come and hear him reflect on his passions and the perseverance to overcome obstacles along the way.

## PELVIC FLOOR DYSFUNCTION AFTER PELVIC TRAUMA

McConnell C<sup>1</sup>, Hawkins S<sup>1</sup>, Granger C<sup>1</sup>

<sup>1</sup>Melbourne Health, Parkville, Australia

**Aim:** To explore the incidence and severity of pelvic floor dysfunction in patients post pelvic fractures.

**Design:** Cross-sectional study.

**Method:** Patients presenting with pelvic trauma who were admitted to a tertiary hospital over a two-year period were included. Patients completed the modified Australian Pelvic Floor Questionnaire (APFQ) and International Index of Erectile Function to assess their self-rated presence and severity of pelvic floor dysfunction, rated pre-injury (retrospectively) and post-injury (range 1-2 years).

**Results:** 48 participants (60% male, mean SD age 54 ± 17years) with pelvic injuries managed conservatively (62%) or surgically (37%) sustained post-accident (29% motor vehicle accident; 27% fall; 29% bike/pedestrian accident; 15%



other) were included. Pre-injury bladder, bowel and sexual dysfunction domain scores (mean SD) on the modified APFQ were  $0.080 \pm 0.096$ ;  $0.123 \pm 0.093$ ; and  $0.086 \pm 0.130$  respectively. Post-injury scores were  $1.500 \pm 0.149$ ;  $0.161 \pm 0.118$ ; and  $0.196 \pm 0.231$  respectively. Scores across all three domains decreased (worsened) post-injury ( $p < 0.05$ ). Scores (mean SD) on the International Index of Erectile Function pre-injury also decreased (worsened) over time (pre-  $18.48 \pm 7.4$ ; post-injury  $16.7 \pm 8.1$ ;  $p < 0.05$ ).

Conclusion: 1 to 2 years post-pelvic trauma, many participants experience pelvic floor dysfunction. Whilst this study found pelvic floor outcomes deteriorated post-injury, scores remained within normative values. Further studies are required to investigate the usefulness of physiotherapy intervention in reducing the incidence and severity of pelvic floor dysfunction specifically in this population.

Key Practice Points:

- Pelvic trauma may lead to increased rates of pelvic floor dysfunction.
- Further research is required to determine whether a significant link exists between pelvic floor dysfunction and pelvic trauma; which subgroups are at risk; and whether physiotherapy intervention influences incidence and/or severity.

## PHYSIOTHERAPY MANAGEMENT OF LUNG CANCER

Granger C<sup>1,2</sup>

<sup>1</sup>The University of Melbourne, Melbourne, Australia, <sup>2</sup>Royal Melbourne Hospital, Melbourne, Australia

This presentation will discuss the evidence-based physiotherapy management of patients with lung cancer, including patients undergoing thoracic surgery. Lung cancer is associated with high disease burden and physical hardship. Patients commonly experience persistent debilitating symptoms including unremitting fatigue and dyspnoea, as well as deterioration in physical function and health-related quality of life that can remain present even five years after diagnosis. These impairments occur due to several factors including the underlying pathological process, effect of medical treatment (thoracic surgery, chemotherapy, radiotherapy and or immunotherapy), multimorbid disease, and or a history of sedentary behaviour. Over the last decade there has been rapid growth in the evidence for exercise training in the management of lung cancer to prevent, treat or minimise such impairments. Exercise training is now seen as a safe, effective and critical component in the management of lung cancer, and this should be a core component of physiotherapy management. This presentation will specifically focus on two aspects of lung cancer care. Firstly, the presentation will discuss the latest evidence and practice recommendations for acute physiotherapy management of patients undergoing thoracic surgery including prehabilitation and immediate post-operative inpatient management. Secondly, the presentation will discuss the role of exercise training and prescription for patients with lung cancer across the disease continuum. This will include the rationale, role and evidence supporting exercise; timing of exercise; and barriers to exercise from the perspective of patients and the healthcare system. Finally, current and future directions of research in this field will be described.

Key Practice Points:

- Physiotherapy is critical in the management of patients with lung cancer.
- Core components of physiotherapy management include acute care for patients immediately post-thoracic surgery, as well as exercise training and prescription for patients across the disease continuum.
- Prehabilitation, or exercise training, before thoracic surgery is supported by growing evidence, particularly with respect to improving fitness levels before surgery, yet the feasibility of implementing prehabilitation in the Australian healthcare system remains uncertain.

## PHYSIOTHERAPY IN THE MEDIA; PERSPECTIVES FROM THE ABC TOP 5

### Granger C

Be prepared to be inspired. This interactive panel session will showcase the cardiorespiratory keynote and invited speakers beyond the cutting-edge research that they are presenting elsewhere on the program. Attendees will have the opportunity to ask questions and drive the discussion. In 2018 Dr Catherine Granger was one recognized by the ABC as one of Australia's top 5 emerging scholars. Catherine is an outstanding communicator with a background in translating research into practice thanks to an NHMRC fellowship. Come and hear of her experience, and how valuable it is for the physiotherapy profession to be engaged with the public and other stakeholders.

## INTERVENTIONS FOR CONGENITAL TALIPES EQUINOVARUS – A COCHRANE SYSTEMATIC REVIEW

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**Aim:** From the best available evidence what is the effectiveness of interventions for Congenital Talipes Equinovarus (clubfoot)?

**Design:** Systematic review of all randomised and quasi-randomised controlled trials evaluating interventions for clubfoot.

**Method:** Participants of any age with clubfoot in either one or both feet who underwent any intervention for clubfoot.

**Results:** 21 trials involving 905 participants met the inclusion criteria. All trials utilised the Pirani Score, a measure of foot alignment where a higher score represents a more severe foot. The Ponseti technique was found to be superior at improving Pirani Scores at the end of serial casting compared to the Kite technique (MD -1.15, 95% CI -1.32 to -0.98) and the Copenhagen technique (MD -1.5, 95% CI -2.28 to -0.72). No statistically significant difference were found in Pirani scores at the end of serial casting between standard and accelerated Ponseti techniques (MD 0.31, 95% CI -0.40 to 1.02); or between plaster of Paris and semi rigid fibreglass (MD 0.46, 95% CI -0.07 to 1).

**Conclusion:** The Ponseti technique demonstrates superior outcomes at the completion of serial casting. Modifying this technique by an accelerated protocol or use of semi-rigid fibreglass may produce as good results as the standard technique at the end of serial casting.

**Key Practice Points:**

- The Ponseti technique produces superior outcomes at the end of serial casting
- An accelerated Ponseti technique may be as effective as weekly casting
- In the Ponseti technique, semi-rigid casting may be as effective as plaster of Paris

## ASSESSMENT OF IDIOPATHIC TOE-WALKING

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**Introduction/Background:** Children with idiopathic toe walking are commonly referred to or self-refer to paediatric physiotherapy services. Surveys at a national and global level have highlighted the widespread variation in the assessment and treatment of this condition. This is in part, due to a limited evidence-base in both of these areas. Common assessment criteria for this condition are important not only to differentiate idiopathic and non-idiopathic toe-walking, but to also assess the outcomes of interventions.

**Aims/objectives:** To improve the participants' knowledge, skills and clinical assessment of idiopathic toe-walking. Participants will be familiarised with the Evidence-based clinical care guideline for Management of Idiopathic Toe-walking and be competent in the clinical application of the Toe-walking tool and a new system of idiopathic toe-walking assessment developed via an expert Delphi Panel.

**Approach:** The presenters will provide a background of the challenges to assessment and management of idiopathic toe-walking, followed by theory and demonstration in the use of the assessments. Copies of the assessment tools will be provided.

**Key Practice Points:**

- Participants will be able to confidently differentially diagnose idiopathic and non-idiopathic toe-walking
- Participants will be able to confidently utilise key objective measures in the assessment of children with idiopathic toe-walking

**Proposed impact, if any, on the health outcomes of the Aboriginal and Torres Strait Islander peoples:** The information from this presentation can be applied to those working with Aboriginal and Torres Strait Islander children, however it is not expected that this will significantly improve health outcomes.

## DEFINING RECOVERY IN CHRONIC WHIPLASH: A QUALITATIVE STUDY

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**Aim:** To define the meaning of recovery from whiplash and the factors influencing recovery by exploring the perceptions of people with chronic whiplash and their treating physiotherapists.

**Design:** Qualitative study using an interpretive descriptive approach.

**Method:** Semi-structured in-depth interviews were conducted with 13 patient participants with chronic whiplash and seven physiotherapists. Patient participants were asked what recovery meant to them, and perceptions around barriers and facilitators to recovery were explored. Physiotherapists were also asked to share their beliefs on the meaning of recovery, and what they believe recovery means to their patients.

**Results:** Both patient participants and physiotherapists perceived recovery to be defined within the themes of emotional well-being, pain and function. Patient participants also identified self-perception as important, whilst physiotherapists identified ownership on the part of the patient, and the multidimensional nature of recovery, including cultural values and beliefs, as important.

**Conclusion:** The meaning of recovery to people with whiplash is inherently complex, multidimensional and highly individual in nature. Increasing clinician awareness of the individual nature of perceived recovery may be the first step toward understanding what is important to people with chronic whiplash. In turn clinicians may be able to focus on the aspects of recovery that are likely to create the most meaningful change to their patients.

**Key Practice Points:**

- In addition to pain intensity and disability, the measurement and conceptualization of recovery may focus on emotional wellbeing, self-perception, and the cultural values and beliefs of the patient.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The meaning of recovery from musculoskeletal injury is complex, regardless of the population under consideration. Therefore the results

of this work hold no greater significance to the Aboriginal and Torres Strait Islander population than they do to the non-Indigenous population.

## INDEPENDENT PHYSIOTHERAPY GYM USE IN A NEUROLOGICAL REHABILITATION POPULATION: UPTAKE AND PERCEPTIONS OF THE MY GYM PROGRAM

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**Aim:** To evaluate if patients with mixed neurological conditions in inpatient rehabilitation choose to independently access a physiotherapy gym space ('My Gym') and to examine patient and carer experiences of exercise and My Gym.

**Design:** Observational mixed-methods study.

**Method:** Patients admitted to a neurological rehabilitation ward were assessed by their therapist for their eligibility and safety to participate in My Gym. Eligible patients, with or without carer assistance, were permitted independent access to the physiotherapy gym space outside of scheduled weekday therapy to follow an individualised therapist-prescribed exercise program. Uptake, frequency, duration and adverse events of My Gym access was recorded. Semi-structured interviews were performed with six patients and three carers.

**Results:** Over five months, 25 out of 69 inpatients were suitable to participate in My Gym and 15 patients were set up with a program. Six patients, two with carer assistance, attended My Gym: median (IQR) number of sessions was 5 (5-10) and median (IQR) session duration was 40 (38-50) minutes with no adverse events reported. Patients perceived that My Gym empowered them and helped them to fill free time during their admission.

**Conclusion:** My Gym can offer some patients admitted for neurological rehabilitation an opportunity to independently and safely participate in individualised, therapist-prescribed exercises, thereby increasing exercise dose and responsibility.

**Key Practice Points:**

- The My Gym describes a unique model of care which provides opportunities for patients with neurological conditions to increase practice time and autonomy.
- This model challenges traditional clinician-led rehabilitation by exploring patient-driven practice.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research outlines exercise opportunities for people with neurological conditions in hospital. It isn't specific for Aboriginal and Torres Strait Islander people and therefore improved results in this population aren't expected.

## EFFICACY OF LOAD MANAGEMENT EDUCATION WITH EXERCISE FOR GLUTEAL TENDINOPATHY COMPARED TO CORTICOSTEROID INJECTION OR WAIT AND SEE – RESULTS OF THE LEAP RANDOMISED CLINICAL TRIAL

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**Aim:** Education and exercise are recommended for other tendinopathies, but evidence has been lacking for gluteal tendinopathy (GT). To compare the effects of a programme of load management education plus exercise (EDX), injection of corticosteroid (CSI), and a wait and see approach (WS), on global improvement and pain in individuals with GT.

**Design:** Prospective, multi-site, randomised clinical trial.

**Method:** 204 participants with symptomatic GT, diagnosed clinically and confirmed with MRI, were allocated to EDX, CSI or WS. Primary outcomes were Global Rating of Change (GROC) using an 11-point scale dichotomised to improved

(moderately to very much better) and not improved (very much worse to somewhat better), and pain intensity (0=no pain, 10=worst pain) at 8- and 52-weeks.

Results: At 8-weeks, improvement reflected by GROC was reported by 51/66 EDX participants, 38/65 CSI and 20/68 WS. EDX and CSI were better than WS (Risk Difference (95%CI): 49.1% (34.6, 63.5), 29.2% (13.2, 45.2)). EDX was better than CSI (19.9% (4.7, 35.0)). At 52-weeks, improvement was reported by 51/65 EDX participants, 36/63 CSI and 31/60 WS, with EDX better than CSI (20.4% (4.9,35.9)) and WS (26.8% (11.3,42.3)). Pain followed similar patterns of differences between treatments except that differences between EDX and CSI were not statistically significant at 52-weeks ( $p=0.53$ ).

#### Key Practice Points:

- Patient-rated improvement for management of gluteal tendinopathy is greater after EDX than CSI or WS in both the short and long-term.
- Pain levels are lower after either treatment than with WS, but EDX provides greater relief in the short-term.

## ANOTHER PATHWAY FOR COMPETENCY-BASED TRAINING IN PELVIC FLOOR PHYSIOTHERAPY PRACTICE - THROUGH EXPERIENTIAL LEARNING, CLINICAL MENTORSHIP AND COMPETENCY ASSESSMENTS

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Aim: To outline a pathway to clinical competence from novice to expert pelvic physiotherapist through the development of knowledge, skills and professional attributes via workplace mentorship and competency assessment.

Design: Illustrative case study

Method: Applying a published pelvic health physiotherapy competency based training framework to existing mentoring and competency assessment processes used at the Mater Health (South Brisbane).

Results: Mater Physiotherapy provides pelvic health physiotherapy to patients within the Obstetrics, Gynaecology, Urology, Colorectal, Gastroenterology and Pain services. Clinician experience ranges from novice through to pelvic physiotherapist Level 3 clinicians (ICS Guideline) providing the full range of pelvic physiotherapy. Mentorship is provided in a variety of ways within the physiotherapy and multidisciplinary team (one on one, shadowing, group mentoring, reverse mentoring, multidisciplinary mentoring and spot mentoring). Formal competency assessments precede increases in scope of practice. This scope ranges from postnatal perineal observation of pelvic floor muscle (PFM) activation through to treating complex conditions and includes vaginal and rectal digital PFM assessment, trans-abdominal / trans-perineal ultrasound, pessary fitting and electrotherapy. This process is supplemented through professional development via professional associations, universities, private education providers, conferences and in-house clinical and research training opportunities.

Conclusion. Pelvic physiotherapy postgraduate training can be provided through experiential learning via mentorship and competency assessment within a clinical setting.

#### Key Practice Points

- There are multiple pathways for developing increased competence and scope of pelvic physiotherapy practice.
- Health Service Providers can provide a pathway from novice to expert via workplace mentorship and competency assessment while maintaining a high standard of professional practice.

## TRANSFORMING PREGNANCY, BIRTH AND POSTNATAL EDUCATION. DEVELOPING EFFECTIVE PHYSIOTHERAPY INTERVENTIONS FOR EXPECTANT AND NEW MOTHERS IN A DIGITAL AGE.

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**Aim:** To develop effective perinatal education (PNE) for physical activity/musculoskeletal changes through pregnancy and post birth. This will deliver the right content, in the right way, at the right time.

**Design:** A cross sectional mixed methods needs assessment to inform intervention design.

**Method:** Three-part needs assessment:

A. Descriptive analysis of data on participation, content and format of PNE at Mater Mothers Hospital (MMH) (October 2018).

B. An online survey of 150 women at the MMH across the perinatal journey (May - July 2019) to identify learning needs.

Descriptive statistics are used for quantitative analysis.

C. Qualitative thematic analysis of 30 mother-partner dyad interviews on their preferences and experiences of PNE.

**Results:** Physiotherapy antenatal education attendance was 17.5% of the patient population; with 3.3% attending postnatal education. This reach is well below the incidence of lumbopelvic pain and incontinence that can be influenced through PNE. Evidence-practice gaps were identified in the use of active learning, peer teaching, digital media and timing of education.

These findings and those from studies B and C that listen to expectant and new parents will contribute to developing PNE that builds participants self-efficacy, motivation, capability and opportunity to achieve desired outcomes.

**Conclusion:** Transforming perinatal education (right content, right time, right way) starts with a multi-modal needs assessment and applies behaviour change theories.

**Key Practice Points:**

- Needs assessment of expectant and new mothers is the first step in perinatal education development.
- Effective education is patient focussed and applies behaviour change theories.

**Proposed impact,** if any on the health outcomes of Aboriginal and Torres Strait Islander people: Indigenous women and/or babies make up 2.6% of births at MMH. We anticipate representative participation in this research and will report on participation rates and findings specific to this population to ensure women's needs and opinions are listened to.

## THE AIR TEST HAS THE HIGHEST ACCURACY FOR PREDICTING A POST OPERATIVE PULMONARY COMPLICATION FOLLOWING ABDOMINAL SURGERY

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**Aim:** This study aimed to compare Melbourne Group Score components to determine which has the highest accuracy to predict a post-operative pulmonary complication following abdominal surgery.

**Design:** Patient-level data from four prospective multicentre clinical trials were combined for analysis.

**Method:** Participants were adults who had major abdominal surgery. Assessors screened participants for a pulmonary complication for the first 14 postoperative days using the Melbourne Group Score. The Air Test is one component of the Melbourne Group Score and was considered positive if oxyhaemoglobin saturation was less than 90% on room air.

Accuracy of the Melbourne Group Score components to detect a pulmonary complication were calculated and compared.



Results: Of 1156 participants, 19% (n=215) developed a pulmonary complication. On postoperative day one the accuracy of each component to predict a pulmonary complication was 66% imaging, 50% auscultation, 82% Air Test, 77% sputum colour, 63% sputum culture, 79% temperature, 52% white cell count.

Conclusion: On postoperative day one, the Air Test had the highest accuracy for predicting a pulmonary complication compared to other components of the Melbourne Group Score.

Key Practice Points:

- Routine provision of supplemental oxygen post major abdominal surgery may mean oxygen saturation levels are currently only assessed with supplemental oxygen in place
- Physiotherapists are well placed to introduce the Air Test as a routine simple, low-cost, non-invasive bedside test which may unmask otherwise concealed early signs of pulmonary dysfunction
- Physiotherapy resources may be directed by results of the Air Test on the first post-operative day

## IMPLEMENTING AND EVALUATING THE BRIDGES STROKE SELF-MANAGEMENT PROGRAMME INTO A NEW ZEALAND DISTRICT HEALTH BOARD: A CASE STUDY

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Aim: To evaluate implementation of the Bridges Stroke Self-Management Programme (Bridges) into a New Zealand District Health Board (DHB) stroke service.

Design: A case study design informed by Normalisation Process Theory (NPT) and qualitative evaluation was used.

Method: Participants were all staff involved in stroke care. We implemented Bridges via six 'Plan Do Study Act' cycles. Training involved two workshops separated by four months of supported implementation. Evaluative data were from surveys, focussed discussions, case reflections and qualitative interviews.

Results: Of the 57 staff initially trained, 12 staff attended follow-up training and only six agreed to be interviewed. To accommodate shifts, nurses (n=18) had to be trained separately. Staff were supported in implementation by staff "Champions", drop-in sessions, newsletters, posters, peer review observations, and a staff learning platform. Integrated data analysis identified that staff valued Bridges, but small patient numbers, lack of time and other competing initiatives, compounded by high staff turnover, limited full uptake. Some staff were able to transfer their learnings to patients with other conditions. There was however a shift in staff language towards prioritising self-management and to patient-centred goal setting.

Conclusion: Using NPT with management support and staff endorsement resulted in greater awareness of self-management but limited full uptake of Bridges, highlighting the challenges of implementing novel interventions.

Key Practice Points:

- The Bridges programme can increase staff awareness of patient self-management.
- Changing a whole multidisciplinary team approach requires focused, sustained effort.
- Training workshops alone are insufficient; a variety of ongoing training strategies are required.

Proposed impact on Aboriginal and Torres Strait Islander people: As located in New Zealand, this did not impact on the Aboriginal and Torres Strait Islander community, however prior Māori consultation endorsed the Bridges approach as it enables the individual and their whānau (family) to take charge of their rehabilitation.



## BENCHMARKING SERVICE PROVISION, SCOPE OF PRACTICE AND SKILL MIX FOR PHYSIOTHERAPISTS IN ADULT CF CARE DELIVERY

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**Aim:** To describe the delivery of physiotherapy services for adults with cystic fibrosis (CF) in terms of service provision, scope of practice and skill mix and benchmark these outcomes against current recommendations in clinical practice guidelines.

**Design:** A prospective cross-sectional study

**Participants:** All adults with CF attending an Australian tertiary adult CF service centre for inpatient and outpatient care and all physiotherapists participating in service delivery across a three-month period.

**Outcome measures:** Physiotherapy services were described by number and skill level of physiotherapists and total hours of activity, and number, type and duration of all physiotherapy activity.

**Results:** Staffing (two rotational junior and two senior physiotherapists) was <50% of recommended full-time equivalent numbers for the centre size. Twenty-two physiotherapists contributed to care. Respiratory (n=1059, 33%), and exercise treatments (n=338, 11%) were the most frequent clinical activities. Exercise testing (n=20, 1%), and detailed treatment reviews (n=79, 2%) occurred infrequently. Time for research was limited. Junior physiotherapists undertook more exercise treatments per day (3.4, 2.8 to 4.0), with senior physiotherapists attending outpatient clinics (-2.9, -3.7 to -2.1) (mean difference, 95%CI).

**Conclusion/Key points:**

- Physiotherapy service delivery occurring in a large adult cystic fibrosis is described for the first time.
- Staffing was below recommended guidelines and high numbers of staff were involved in service delivery.
- Whilst some key aspects of CF physiotherapy treatment were met, other recommended activity occurred infrequently.
- Future studies are required to determine innovative approaches to address the gaps in service recommended in the clinical guidelines

## SOLVING THE COMPLEXITY OF CONCUSSION

**Hamilton M<sup>1</sup>**

<sup>1</sup>Epworth Healthcare, Newport, Australia, <sup>2</sup>Concussion Central, Altona North, Australia

**Introduction/ Background:**

Persistent concussive symptoms affect 10 – 20% of individuals who sustain a concussion and can linger for months. These symptoms are frequently multi-faceted, involving both physical and psychological elements, and cause significant negative impact on functional and social wellbeing. Due to the complexity of symptoms and infancy of concussion research, assessing and treating these patients is often clinically challenging.

**Aims:** To present the holistic assessment, analysis and evidence based treatment of a complex concussion case.

**Approach:** A complex case study will be utilised to illustrate how to assess the function and interaction of the cervical, vestibular, autonomic, visual and psychological systems following concussion, using appropriate outcome measures, in a multidisciplinary clinic setting. The clinical reasoning involved in this case will be outlined, describing the underlying anatomical and neurophysiological dysfunctions present. The treatments utilised and outcomes for this case will be presented and the current state of literature to support interventions examined.

**Key Practice Points:**

For patients with persistent concussion symptoms, clinicians will learn how to:

- Perform assessments employing validated outcome measures
- Employ advanced clinical reasoning skills to understand the neuroanatomical structures involved
- Appropriately select treatment interventions, whilst considering the current supportive literature

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: If adapted to incorporate the appropriate sociocultural approaches the outlined methods of assessment, clinical reasoning and treatment selection has the potential to be effective when working with Aboriginal and Torres Strait Islander people.

## WHAT IMPACT DO CHRONIC DISEASE SELF-MANAGEMENT SUPPORT INTERVENTIONS HAVE ON HEALTH INEQUITY GAPS RELATED TO SOCIOECONOMIC STATUS?

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<sup>1</sup>*Latrobe University School Of Rural Health, Mildura, Australia*

**Aim:** To assess the differential impact of socioeconomic status on self-management support interventions for chronic disease; in relation to participation, retention and post-intervention outcomes.

**Design:** Systematic review with narrative synthesis

**Method:** Studies of any design reporting on outcomes from chronic disease self-management support interventions were included, provided that socioeconomic status was recorded and a between-groups comparison based on socioeconomic status was made. Possible outcomes were participation rates, retention rates, clinical or behavioural post-intervention results.

**Results:** 19 studies were identified, with five studies of participation rates, five of attrition rates and nine studies reporting on post-intervention outcomes. Meta-analysis was not possible due to the heterogeneity of studies. All participation studies reported reduced engagement in low socioeconomic status groups. Studies assessing retention and post-intervention outcomes had variable results, related to the diversity of interventions. Health disparity was reduced only in longer, individually tailored interventions. The commonest theoretical justification given for interventions was Bandura's concept of self-efficacy, but this may have limited applicability in lower socioeconomic status populations.

**Conclusion:** Health inequity is rarely addressed in studies of self-management support interventions. The limited research suggests that without careful tailoring and direct targeting of barriers to self-management, interventions may increase health disparity. Specific screening for individual capacity or workload may ensure that tailored interventions are only directed to those who need them.

### Key Practice Points:

- Self-management support interventions may increase health disparity
- Interventions tailored to address individual capacity and workload, rather than targeting self-efficacy, may be more beneficial for disadvantaged populations.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Aboriginal and Torres Strait Islander people are overrepresented in low socioeconomic and chronic disease populations. The findings and recommendations from this study are likely to be relevant to their health needs.

## AQUATIC PHYSIO IS WORTHWHILE AFTER ALL

**Harrison J<sup>1</sup>**

<sup>1</sup>*Hydrotherapy Brisbane, Aspley, Australia*

Case history of a 54-year-old man with an Acquired Brain Injury who returned to hydrotherapy after his 'land' health care workers suggested it was of little value. Despite the difficult logistics of getting him to the hydrotherapy centre away from his live-in slow stream rehabilitation facility, his wife persisted and gained sufficient National Disability Insurance Scheme funding to make weekly attendance possible. The outcomes were significant.

## EVIDENCE-BASED PRACTICE AMONG PHYSIOTHERAPISTS: KNOWLEDGE, SKILLS AND BARRIERS

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**Aim:** A challenge faced by physiotherapists is having the time, knowledge and skills to use research to guide clinical practice. The primary aim was to quantify knowledge, skills and barriers to evidence-based practice.

**Design:** A single-group, pre-post evaluation of an evidence-based practice training program.

**Method:** All physiotherapists from the South Western Sydney Local Health District were invited to participate. At baseline, participants completed the Assessing Competency in Evidence-based Medicine scale (knowledge and skills; range 0-15) and Barriers to Research Utilization Scale (scoring based on four subscales: research, healthcare provider, setting, and presentation; range 0-4).

**Results:** 104 physiotherapists completed the baseline assessments; mostly women (78%), aged less than 30 (74%), in physiotherapy practice less than 10 years (82%). 16% worked in the cardiorespiratory area and most were in positions that could rotate through acute care. The mean (standard deviation) score for knowledge and skills was 9.5 (1.6) out of 15. Research design (group allocation and intention-to-treat) and interpreting results were the largest knowledge gaps. The Barriers subscales with the highest scores were presentation (2.6 (0.5) out of 4) and setting (2.6 (0.5)).

**Conclusion:** There is scope for improvement in evidence-based practice knowledge and skills among physiotherapists. This could involve targeted training to enhance knowledge and skills, and building a culture that values embedding research evidence in clinical practice.

### Key Practice Points:

- Continuing professional development activities are required to enhance physiotherapists' knowledge and skills in evidence-based practice.
- Workplace initiatives are needed to address perceived barriers to evidence-based practice.

## EVIDENCE-BASED MANAGEMENT OF DYSKINESIA IN CEREBRAL PALSY: WHERE ARE WE NOW AND WHERE ARE WE HEADING?

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**Background:** Dyskinesia is a complex movement disorder commonly seen in children with cerebral palsy. It often leads to a range of comorbidities including pain. Pain poses unique problems in the cerebral palsy population with challenges around accurate assessment and effective management. Dyskinesia and pain impact significantly on participation and quality of life of the children affected and their families. Until recently, there was limited evidence to guide clinical decision-making for children with dyskinetic cerebral palsy. Consequently, management has been based primarily on clinician experience.

**Objectives:** This presentation will report on the outcomes from a program of research aiming to improve the evidence base around 1) the accurate identification and measurement of dyskinesia and pain in cerebral palsy, and 2) interventions which might lead to improvements in participation and well-being.

**Results:** Outcomes from a range of studies will be presented focusing on established and novel methods of assessment, best-evidence management and the lived experience.

#### Key Practice Points:

- There is an emerging evidence base for the accurate identification and measurement of both dyskinesia and pain in cerebral palsy.
- Best-evidence guidelines for the management of dyskinesia in this population are available, however further research into effective interventions is still required.

### ILLUSION-ENHANCED VIRTUAL REALITY EXERCISE FOR NECK PAIN

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**Aim:** Body illusions have shown promise in treating some chronic pain conditions. We hypothesised that neck exercises performed in VR with visual feedback of rotation amplified, would reduce persistent neck pain.

**Design:** A multiple-baseline replicated single case series.

**Method:** 12 blinded individuals with persistent neck pain participated in a four-phase intervention: A. 'Baseline'; B. 'VR' during which participants performed rotation exercises in virtual reality with no manipulation of visual feedback, C. 'VR-enhanced' during which identical exercises were performed but visual feedback overstated the range of motion being performed; D. 'Follow-up'. Primary outcomes were twice-daily measures of pain-free range of motion and pain intensity. During the baseline and follow-up phases, measures were taken but no intervention took place.

**Results:** Following dropouts, data from eight participants were analysed. No overall differences in primary outcomes were found between VR and Baseline, VR-enhanced and VR, or VR-enhanced and Follow-up.

**Discussion:** Our hypothesis, that neck exercises performed in VR with visual feedback of rotation amplified, would reduce persistent neck pain was not supported. Possible explanations and future directions are discussed, along with broader applications of VR in clinical practice.

#### Key Practise points:

- Body illusions have shown promise in treating persistent pain.
- The current approach to illusion-enhanced virtual reality exercises was not effective.
- Future directions and opportunities for using virtual reality in clinical practice will be discussed.

### CAN WE RELY ON A TELECONFERENCE WHEN ASSESSING CALF RAISE EXERCISE FIDELITY? A VALIDITY AND RELIABILITY STUDY

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**Aim:** Exercise fidelity is a fundamental aspect of exercise prescription by physiotherapists (PTs). The aim of this research is to evaluate the concurrent validity and inter-rater reliability of assessing exercise fidelity in Achilles tendinopathy rehabilitation via videoconference. This research is a critical step towards developing the evidence base relating to telerehabilitation and improving PT and consumer confidence in this emerging technology.

**Design:** Observational study

**Methods:** A rating scale with six criteria was developed for assessment of calf raise exercise fidelity based on the current literature and input from eight specialist clinician. Nineteen videos of participants with Achilles tendinopathy undertaking calf raise exercise in a seated and standing position were assessed by an experienced PT (real-time rating).

Two PTs independently rated each criterion (achieved: yes or no) from the recorded videos. Agreement with a real-time rating (gold standard) was used to assess concurrent validity, and between raters agreement to establish inter-rater reliability.

Results: There was substantial to perfect (Kappa=0.76 to 1.00, rater 1) or moderate to perfect agreement (Kappa=0.57 to 1.00, rater 2) between the raters and the gold standard. There was moderate to perfect agreement between raters (0.457 to 1.00).

Conclusion: The telerehabilitation assessment of calf raise exercise fidelity demonstrated acceptable validity and inter-rater reliability. There is potential for improvement in agreement with greater experience or more training.

Key Practice Points:

- Provides clinicians with a tool to evaluate the Achilles tendinopathy exercise fidelity via easily accessible telerehabilitation technology.

## HIGH-FIDELITY SIMULATION-BASED LEARNING IN ACUTE CARDIORESPIRATORY PHYSIOTHERAPY – EFFECT ON CLINICAL PERFORMANCE AND PREPAREDNESS

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Aim: To determine the effect of high-fidelity simulation-based learning on the clinical performance and preparedness of physiotherapy students and physiotherapists in acute cardiorespiratory physiotherapy.

Design: Mixed-methods review

Method: Quantitative and qualitative studies that used high-fidelity simulation (full-body computerised mannequins capable of real-time responses) were included. Clinical performance referred to outcomes relating to skills and knowledge whilst preparedness related to outcomes relating to confidence and self-efficacy. Studies were only included if there was an English full text available and if data on physiotherapy participants, the cardiorespiratory setting and high-fidelity mannequin simulation data could be extracted. PROSPERO registration is CRD4201912094.

Results: Eleven studies were identified, and two trials had data that could be pooled in a meta-analysis. High-fidelity simulation-based learning had a minimal positive effect on clinical performance as measured by Assessment of Physiotherapy Practice (APP) (0.29, 95% CI -0.07 to 0.64, p=0.09, I<sup>2</sup>=65%) of physiotherapy students. The remaining studies indicated positive effects of high-fidelity simulation based-learning. However, they differed substantially in intervention delivery and outcomes and/or were quasi-experimental designs preventing pooling of results. Nine qualitative themes were identified – knowledge/exposure, skill performance/intervention, learner satisfaction, critical thinking/decision making, self-confidence, safety, communication, multi-tasking and realism. Identified quantitative studies only provided evidence for physiotherapy students.

Conclusion: Current evidence on high-fidelity simulation-based learning in physiotherapy lacks standardised interventions and varies considerably in the types of outcomes measured, therefore, further research is required.

Key Practice Points:

- High-fidelity simulation-based learning may be useful in acute cardiorespiratory physiotherapy education, although learner/educator preferences and availability of resources should be considered.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research outlines a type of physiotherapy education intervention in physiotherapy. It isn't specific for Aboriginal and Torres Strait Islander people and therefore benefit to this population is unclear.

## BARRIERS AND FACILITATORS TO PROVIDING PULMONARY REHABILITATION TO INDIVIDUALS FROM CULTURALLY AND LINGUISTICALLY DIVERSE BACKGROUNDS

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**Aim:** To investigate referral and participation rates of individuals from culturally and linguistically diverse backgrounds in pulmonary rehabilitation programs in Sydney, Australia, and potential barriers and facilitators to providing pulmonary rehabilitation to these individuals.

**Design:** A mixed methods study, using a sequential, qualitative dominant, participant-selection variant of explanatory design.

**Method:** Participants were coordinators of pulmonary rehabilitation programs in Sydney. In stage one 17 participants completed a quantitative web-based survey. In stage two semi-structured telephone interviews were conducted with eight participants to gain qualitative information; these participants were a nested sample of participants from stage one. Stage three involved the integration of quantitative and qualitative data to provide analysis of the key outcomes.

**Results:** All participants reported receiving referrals of individuals from culturally and linguistically diverse backgrounds, although referral numbers varied between programs. Interpreters were often used for initial assessments of individuals with limited English proficiency, however were not often used during the program. Barriers included cultural factors that programs were unable to accommodate, communication difficulties, challenges using interpreters, and resource limitations. Potential facilitators included alternate methods of communication, engaging family support, and optimising utilisation of interpreters.

**Conclusion:** This study identified that whilst many individuals from culturally and linguistically diverse backgrounds are referred to pulmonary rehabilitation there are a number of potential barriers to providing pulmonary rehabilitation to these individuals.

**Key Practice Points:**

- A greater understanding of these barriers, and using potential facilitators, may help to improve the participation of individuals from culturally and linguistically diverse backgrounds in pulmonary rehabilitation.

## STRENGTH TRAINING TO IMPROVE WALKING AFTER STROKE: HOW THERAPIST, PATIENT AND WORKPLACE FACTORS INFLUENCE EXERCISE PRESCRIPTION

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**Aim:** To explore what influences physiotherapists when prescribing strength training with stroke survivors undergoing rehabilitation for gait impairment in Australia.

**Design:** A qualitative study with semi-structured interview questions.

**Method:** Interviews were conducted with a convenience sample of physiotherapists currently providing rehabilitation services to patients following stroke in Australia. Interviews were transcribed verbatim and Line-by-line thematic analysis was undertaken to create themes and sub-themes.

**Results:** Participants were 16 physiotherapists (12 female) with 3 months – 42 years' experience working with people after stroke. Major themes identified were: 1) patient characteristics influence the approach to strength training, 2)



interpretation of strength training principles varies widely, 3) therapist confidence and preference influences the delivery of strength training and 4) workplace context affects the treatment delivered.

Conclusion: Physiotherapists displayed wide variety in their interpretation of strength training principles and were often more focused on task practice and repetition. There were many barriers to the effective delivery of strength training including physiotherapists' confidence in their skills and limitations in their resources.

#### Key Practice Points:

- There are many barriers to the implementation of effective strength training programs after stroke.
- Therapist-related barriers highlight the need for improved knowledge, training and research-engagement.
- Limited resourcing demonstrates the need for clinical guidance that is clear, accessible and easy to implement in practice.

## TRANSFORMING REHABILITATION FOR THORACIC SPINE PAIN AND DYSFUNCTION

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Background: The thoracic spine has for a long time been the 'Cinderella' region of the spine; with less research and clinical focus directed to this region compared with the cervical and lumbar spine. Additionally, there continues to be a limited understanding of the aetiology and epidemiology of a range of musculoskeletal presentations, which have a biomechanical or neurophysiological connection to the thoracic spine. Through our research (systematic reviews, surveys, observational studies, reliability and validity studies etc.) we have gained a greater understanding of thoracic spine dysfunction, practice and management approaches, and developed approaches to transform the rehabilitation practices used for patients presenting with thoracic spine pain and/or dysfunction.

Objectives: This keynote will critically evaluate evidence for the under-explored functional kinematics, primary or secondary pain sites, and asymptomatic dysfunction of the thoracic spine. A secondary objective is to explore the emerging interest in this spinal region with 1) best practice guidelines and evidence supporting the use of thoracic spine manipulation in the management of upper quadrant presentations 2) the development of validated clinical measurement approaches to evaluate thoracic movement and, 3) the development of an outcome focused (mobility, motor control, work capacity and strength) clinical reasoning framework for thoracic spine exercise prescription in rehabilitation.

#### Key Practice Points

- Thoracic spine contributes to upper limb functional kinematics across different planes and range of motion
- Thoracic spine pain and dysfunction is evident in common clinical presentations such as COPD, WAD, chronic neck pain
- Validated clinical assessment using iPhone or inclinometer in heel sit position may transform assessment of thoracic spine mobility and evaluation of interventions in rehabilitation
- Outcome focused clinical reasoning can transform exercise prescription in thoracic spine rehabilitation

## DETERMINING CLINICIANS' DEFINITION AND DIAGNOSIS OF INFLAMMATORY CONDITIONS OF THE LACTATING BREAST: A MIXED METHODS STUDY

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Aims: To determine how Australian physiotherapists clinically define and diagnose Inflammatory Conditions of the Lactating Breast and is this influenced by region or facility?

Design: Cross-sectional mixed methods.



**Method:** An online survey consisting of quantitative and qualitative questions was completed by 63 Australian physiotherapists who regularly treated Inflammatory Conditions of the Lactating Breast.

**Results:** Physiotherapists' definitions varied, with emergent themes including definitions based on pathophysiology (57%), combination of local and systemic symptoms (38%), syndromes (32%), local symptoms (25%) and breast function (16%). These findings were supported by quantitative data; blocked ducts (83%), abscess (65%) and engorgement (65%) were considered Inflammatory Conditions of the Lactating Breast by some, but not others (17%, 35%, 35% respectively). For diagnosis, the emergent theme was inconsistency amongst physiotherapists (n=39) in the number or combination of local or systemic symptoms required. Quantitative data corroborated this theme; 63% of physiotherapists required more than one symptom to make a diagnosis, but 27% required only one. Consistency across regions and facilities for the qualitative themes was evident and supported by quantitative data. The exception was Victorian physiotherapists (96%) were more likely to consider blocked ducts an Inflammatory Condition of the Lactating Breast, compared to NSW (71%) or WA (71%)(n = 58; p = 0.04).

**Conclusion:** Physiotherapists have varied definitions and diagnostic requirements of Inflammatory Conditions of the Lactating Breast.

**Key Practice Points:**

- Physiotherapists' may need to qualify their definition and diagnosis transferring or discussing patient care.
- Future treatment guidelines would need to define Inflammatory Conditions of the Lactating Breast when providing recommendations.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research has the potential to improve health outcomes of Aboriginal and Torres Strait Islander women with Inflammatory Conditions of the Lactating Breast, to the same degree as non-Indigenous women.

## SHOULDER PAIN AND AQUATIC PHYSIOTHERAPY: COMPARING LAND VERSUS WATER BASED MANAGEMENT.

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Aquatic Physiotherapy offers a unique environment enabling patients to exercise more freely. It is increasingly used in a myriad of conditions with research demonstrating beneficial effects on pain, physical function and quality of life. As an integral addition to land-based management plans, its inclusion in the management of patients with shoulder pain can improve outcomes and patient satisfaction. Awareness of the impact of water on the body can enable physiotherapists to best manage clients with shoulder pain.

**Key Practice Points**

Understanding and comparing the effects of water versus land based exercise can:

- stimulate critical thinking
- improve clinical management of clients with shoulder pathology
- improve exercise prescription base

## THE MANAGEMENT OF JOINT SURFACE INJURIES IN PROFESSIONAL FOOTBALLERS

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Joint surface injuries are common in professional football players. Injury mechanisms may include traumatic injuries to the joint surface or degenerative joint surface changes associated with completing the extensive training and competitive programs required to participate in professional football.

Each case provides unique challenges for the sports medicine team. Surgical or non surgical management strategies may need to be considered. Physical characteristics of the player, positional requirements, player age and career trajectory may all impact on the clinical decision making process.

**Key Practice Points:**

- Appreciation / understanding of clinical assessment measures of joint surface health objective measurement and management of physical workloads of footballers with compromised joint surfaces and management strategies for ongoing arthrogenic muscle inhibition associated with joint surface injuries in footballers.

## AN UPDATE ON THE LATEST EVIDENCE FOR FALLS PREVENTION ACROSS ALL SETTINGS

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Fall injury rates continue to rise in Australia. Engaging with our clients or patients regarding preventive fall plans is key to their overall health. This presentation will provide an update of fall prevention evidence across community, residential care and hospital settings. Barriers and enablers to translating this evidence into practice will be discussed.

**Key Practice Points:**

- Assist participants to incorporate fall prevention guideline care into individual client plans
- Alert participants to common barriers to uptake and provide strategies for improving implementation of fall prevention care.

## TOWARD RELATIONSHIP-CENTRED CARE: A QUALITATIVE EXPLORATION OF PATIENT-PHYSIOTHERAPIST COMMUNICATION IN PRIVATE PRACTICE

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**Aim:** To understand how patients and physiotherapists communicate with each other in private practice.

**Design:** Qualitative methodology, specifically micro-ethnography, was used to achieve a detailed understanding about how physiotherapists and their patients communicate.

**Method:** Fifty-two consultations between patients and physiotherapists were observed and in-depth interviews with nine patient and nine physiotherapist participants were undertaken. Participants were a purposive convenience sample. Data comprised field notes from observations, and audio-recordings of observations and interviews. Data were analysed iteratively using principles of thematic analysis and grounded theory.

**Results:** Two central and complementary themes emerged from the data. The first theme 'physiotherapist-led communication' encapsulates how physiotherapists directed the style and content of communication to achieve clinical goals by providing structure, making decisions, and focussing on biomedical aspects. The second theme 'adapting to build rapport' describes how adaptive communication such as eye contact, body language, casual conversation, humour and touch, were incorporated by physiotherapists to build rapport.

**Conclusion:** When interacting with patients in private practice, physiotherapists integrate both clinical and adaptive communication. Combined, these two communication styles reflect a relationship-centred approach to communication. Although transferability of these findings to other physiotherapy settings needs to be established, this research provides a platform for further investigation.

**Key Practice Points:**

- Physiotherapists lead communication with patients yet also adapt their communication to individual patient needs, thereby practising relationship-centred care;

- Relationship-centred care offers a descriptive framework for how physiotherapists communicate with patients that can be used for educational purposes and reflective practice.

Proposed impact on health outcomes of Aboriginal and Torres Strait Islander people: It is not expected that these research findings will specifically impact health outcomes of Aboriginal and Torres Strait Islander people. Physiotherapists' awareness of their communication, however, has the potential to improve the experience of physiotherapy for all populations.

## TELEPHONE-DELIVERED EXERCISE ADVICE AND BEHAVIOUR CHANGE SUPPORT BY PHYSIOTHERAPISTS FOR PEOPLE WITH KNEE OSTEOARTHRITIS: THE TELECARE PRAGMATIC RANDOMISED CONTROLLED TRIAL

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**Aim:** Determine effectiveness of incorporating exercise advice and behaviour change support by physiotherapists into an existing nurse-led musculoskeletal telephone service ('Musculoskeletal Help Line') for adults with knee osteoarthritis (OA).

**Design:** Participant- and assessor-blinded randomised controlled trial.

**Method:** 175 people with chronic knee pain were recruited across Australia and randomised to the existing service (n=88) or exercise advice and support (n=87). The existing service received one consultation with a nurse for self-management advice. Additionally, the exercise advice and support group had 5-10 consultations with a physiotherapist trained in behaviour change for a personalised strengthening program and physical activity plan. Primary outcomes were overall average knee pain (range 0-10), and difficulty with physical function (0-68), at 6 (primary time-point) and 12 months (secondary time-point). Secondary outcomes included other measures of pain, self-efficacy, physical activity, kinesiophobia, global changes in pain, function and physical activity, satisfaction and health service usage.

**Results:** 165 (94%) and 159 (91%) participants were retained at 6 and 12 months, respectively. At 6 months, the exercise advice and support group reported greater improvement in function (mean difference 4.7 units (95% CI 1.0, 8.4)), but not overall pain (0.7 units (0.0, 1.4)) than the existing service. Eight of 14 secondary outcomes favoured exercise advice and support at 6 months. By 12 months, most outcomes were similar between groups.

**Conclusion:** Incorporating physiotherapist-led exercise advice and support into an existing telephone service resulted in modest improvements in physical function, and in some, but not all, measures of knee pain and physical activity at 6 months. Whilst some benefits persisted at 12 months, most tended to disappear.

**Key Practice Points:**

- Telephone models allow widespread reach of physiotherapy services and have potential to address underutilisation of behavioural approaches to manage knee OA.
- Clinical significance of findings is uncertain, thus further trials are required.

## DESIGN CONCEPTS FOR CONVERSATIONAL AGENTS FOR HEALTH BEHAVIOUR CHANGE.

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**Aims:** To explore the design and use of Conversational Agents (CAs) for health behaviour change (HBC); to propose initial recommendations of concepts to consider when designing or choosing a clinical HBC CA; and to outline a future research direction for the development of a novel HBC CA.

**Design:** A literature review of diverse fields within digital health research was conducted to investigate design elements relevant for optimising HBC CA design and implementation. From this review, initial summary recommendations are developed regarding key design concepts to be considered for optimising therapeutic effectiveness of HBC CAs. Additionally, examples of relevant research publications reporting HBC CA design are highlighted for the purpose of illustrating the use of these key concepts.

**Results:** Key concepts supporting the optimal design of HBA CAs are identified: behaviour change theories; Motivational Interviewing; Persuasive Computing; risk mitigation; and assessment of feasibility, user experience, and effectiveness. Recent research models which use these key concepts are discussed. A proposed approach for developing a novel HBC CA is presented based upon the key design concepts.

**Conclusion:** HBC CAs represent an emerging field of high clinical utility. The key design concepts presented serve to enhance clinicians' understanding and choices of HBC CAs. Finally, this presentation outlines an application of the key concepts for the development of a novel HBC CA for clients with mild brain injury or mild cognitive impairment.

**Key Practice Points:**

- Awareness of the design concepts that optimise effectiveness in HBC CAs will help clinicians' understanding and selection of these tools.
- Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: HBA CAs can provide effective health support for clients who are at an increased distance, either geographically and/or a socio-culturally, from essential health services. This population of clients includes Aboriginal or Torres Strait Islander people.

## EVIDENCE FOR A WINDOW OF ENHANCED NEUROPLASTIC CAPACITY FOLLOWING ISCHAEMIC STROKE

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**Aim:** It is unclear whether neuroplastic mechanisms are upregulated in humans soon after stroke. This may be critical information to guide timing and delivery of rehabilitative therapy to ensure maximal potential for recovery. The purpose of this study was to quantify neuroplastic capacity of the human motor cortex using non-invasive brain stimulation (NIBS) after stroke.

**Design:** This was a longitudinal, multi-centre study that quantified neuroplastic capacity of the primary motor cortex across multiple time points between 7 days to 12 months post stroke.

**Method:** In Adelaide, neuroplastic capacity of the ipsilesional cortex was investigated in 31 ischemic stroke survivors. In London, neuroplastic capacity of the contralesional cortex was investigated in 29 ischemic stroke survivors. At both sites, an inhibitory NIBS protocol was used at each experimental session to induce long-term depression synaptic plasticity. Change in neuroplastic capacity over time was quantified with a linear mixed model.

**Results:** Following stroke, neuroplastic capacity measured with NIBS was statistically strongest at two weeks post stroke in the contralesional hemisphere ( $p=0.02$ ) and demonstrated a non-significant trend for a stronger response between week 2-3 in the ipsilesional hemisphere ( $p=0.055$ ).

**Conclusion:** This is the first study to quantify neuroplastic capacity over a period of 12 months in the human cortex following stroke. Using NIBS, we demonstrate a spontaneous period of enhanced neuroplasticity beginning at approximately two weeks after stroke. Initiation of rehabilitative therapy within two weeks of stroke may be important to achieve maximal recovery.

## IMPACT OF PILATES INTERVENTION ON PHYSICAL FUNCTION IN CHILDREN WITH HYPERMOBILITY SPECTRUM DISORDER

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**Aim:** To evaluate the impact of a Physiotherapy-led Pilates intervention on physical function and pain levels in children with Hypermobility Spectrum Disorder.

**Design:** Single-case experimental design with multiple baseline design

**Method:** Three subjects with Hypermobility Spectrum Disorder, aged from 8 to 12 years, commenced concurrently in this study. Participants underwent multiple weekly outcome measurements including muscle strength, balance and pain levels. The initial baseline period varied from 5 to 7 weeks, followed by an intervention period for 8 weeks and a withdrawal period of 5 weeks. The Physiotherapy-led Pilates intervention consisted of individual, 45 minute bi-weekly sessions, performed on both mat and Pilates equipment with an additional home program of mat exercises performed weekly.

**Results:** Statistically significant improvements were found in all participants in the strength of at least one muscle group tested and in two participants in balance evaluation with stability limits. There was no significant reduction in pain levels seen with any participants.

**Conclusion/Key Practice Points:**

- This is the first trial of the impact of Physiotherapy-led Pilates intervention for children in Australia.
- Research is in the preliminary stage; however, Pilates may be able to improve strength and balance in children with symptomatic hypermobility.
- Further research is warranted to test the effectiveness of Pilates with different therapy doses, intervention frequency, content, format and in various populations.

## PATIENT PERSPECTIVES OF GROUP UPPER LIMB THERAPY FOR PEOPLE WITH MILD, MODERATE AND SEVERE STROKE-AFFECTED UPPER LIMBS

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**Aim:** Many health services are incorporating group programs to increase intensity of therapy. The aim of this study was to explore participant perspectives of an intensive upper limb group program.

**Design:** A qualitative study using semi-structured interviews and inductive thematic analysis.

**Method:** The participants all participated in 90-minute therapy sessions, 3 days a week for 3 weeks. There were four participants in each group supervised by a physiotherapist and assistant. The group utilised multiple evidenced-based techniques to provide individualised, goal-based therapy with clients with varying upper limb function. The participants were interviewed, and their answers analysed with Nvivo 11 software using coding to establish the main themes.

**Results:** Four main themes emerged from the data: Group therapy has value but is not preferred by participants; Goal based upper limb therapy can be provided in a group setting; Pain and fatigue are not barriers to intensive upper limb therapy; Absence of functional outcomes does not reduce perceived value of group therapy.

**Conclusion:** Stroke survivors appear satisfied that individualised goal-based therapy can be provided in group settings, but preferences are for individual therapy. Clients also noted therapeutic value despite minimal change of function,

possibly indicating additional measures that include psychosocial factors might be relevant for those with more severe impairments.

**Key Practice Points:**

- Stroke survivors do feel their individual goals can be addressed in a group setting.
- Group participants prefer one to one therapy compared with the group.
- Participants still valued group therapy in the absence of functional gains.

## THE PERCEPTION OF FALL RISK AND ITS INFLUENCE ON BEHAVIOUR IN PEOPLE WITH PARKINSON'S DISEASE

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**Aim:** To explore perceptions of fall risk and how these perceptions influence behaviour in people with Parkinson's disease and their care-partners.

**Design:** Semi-structured interviews.

**Methods:** Eight people with moderate to advanced Parkinson's disease who had fallen in the past six months and their care-partners were interviewed. Data was transcribed verbatim and analysed using Grounded Theory.

**Results:** Four main themes emerged: being fearful of falls - particularly of sustaining serious injuries; falls are a part of Parkinson's – the degenerative nature of the disease and its associated impairments making falls inevitable; desire to lead a normal life - weighing up the value of independence and socialisation against the risk of falling; not considering the consequences of falls – where care-partners noted an apparent reluctance for their partner to change some behaviours. The weighing up between perceived fall risk and the desire to perform an activity influenced participants' decisions about behaviour, which ranged from unnecessary avoidance or adaptation of activities, to appropriate avoidance or adaptation of the activity, to unnecessary risk taking.

**Conclusions:** Fall prevention intervention for people with more advanced Parkinson's disease could be facilitated by therapists developing an understanding of their patients' perceptions of fall risks and the value they place on behaviours and activities.

**Key Practice Points:**

- Therapists can work with people with Parkinson's disease and their care-partners to understand their views about fall risks and the value they place on particular activities.
- This will facilitate the development of fall prevention interventions that utilize collaborative problem solving and goal setting.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research is not specific for Aboriginal and Torres Strait Islander people.

## SUBJECTIVE IMPRESSIONS OF PAIN IN THE NEONATAL INTENSIVE CARE UNIT ARE POORLY CORRELATED TO OBJECTIVELY ASSESSED PAIN IN INFANTS

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**Aim:** To compare the accuracy of nurses' perception of infant pain to an objective measure of pain called the Pain Assessment Tool (PAT).

Design: Retrospective medical record review of a neonatal intensive care unit (NICU).

Methods: 59,097 pain assessments performed in a NICU was assessed for diagnostic accuracy using the PAT as the reference standard and nurses' perception as the test. We also assessed the correlation of each item of the PAT to the final score using the corrected item-total correlation.

Results: Only 32.9% (95% confidence interval = 32.0 to 33.8) of assessments were correctly identified as painful by nurses in the NICU; however, nurses were able to discern infants that did not have pain (specificity = 99.7%, 95% confidence interval = 99.7 to 99.8). When items of the PAT were assessed, behavioural cues including posture, sleep, and expression moderately correlated (Pearson correlation coefficient = .3 to .4) to the overall score. Crying and physiological cues including colour, respiration, oxygen saturation, and blood pressure (Pearson correlation coefficient = .0 to .1) correlated poorly to the overall score. Subgroup analyses were undertaken.

Conclusions: Subjective impressions of pain may not be enough in determining the need for pain relief in the NICU, especially in infants with long term admissions.

Key Practice Points:

- Validated pain assessment tools are essential in recognising pain in critically ill infants. Infants who require long term admissions in the NICU and who are no longer receiving routine pain assessments are especially vulnerable to under-recognition of pain by clinicians.

## PHYSIOTHERAPY TREATMENT OF FUNCTIONAL NEUROLOGICAL DISORDER: AN AUDIT OF PATIENT CARE BASED ON CONSENSUS RECOMMENDATIONS

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Aim: To determine compliance of physiotherapy intervention for functional neurological disorder patients compared to the 2015 consensus recommendations.

Design: Clinical audit

Method: A retrospective audit of functional neurological disorder patients admitted to Epworth Healthcare between 2011 and 2018 was undertaken. A checklist was developed from recommendations and an independent reviewer extracted data from electronic histories on five domains: diagnostic testing, biopsychosocial model of care, physiotherapy and movement retraining interventions, outcomes measurements and discharge planning. Consensus compliance was reported either as achieved or not achieved for all domains for each patient and physiotherapy interventions were categorised.

Results: Six patients with functional neurological disorder were audited. A biopsychosocial approach was used in all patients (100%). Individual patient specific diagnostic testing and observations were reported. Physiotherapy interventions included reducing self-directed attention (60%), distraction (80%), exercise (100%), visualisation (40%), use of mirrors and video (40%). Outcome measures were not routinely completed. The functional independence measure was completed in 83% of patients, and the ten-metre walk test in 67% of patients. A self-management plan was provided to four patients on discharge from therapy.

Conclusion: Physiotherapists used a biopsychosocial approach for treatment and most commonly applied distraction techniques and exercise. Outcome measurements were less consistently used, however, discharge planning generally included a self-management plan.

Key Practice Points:

- The consensus recommendations can guide clinical practice of physiotherapists who treat functional neurological disorders.



## FUNCTIONAL ANATOMY AROUND THE PELVIC GIRDLE AND A BRIEF SUMMARY OF HOW PELVIC HEALTH PHYSIO MAY TREAT THIS PROBLEM

**James A<sup>1</sup>**

<sup>1</sup>*Sydney Pelvic Clinic, Sydney, Australia*

This lecture will discuss the relevant functional anatomy of the pelvic girdle, including the sacroiliac joint and pubic symphysis. The lecture will also discuss the management involved for patients presenting with pelvic girdle pain.

## CONSERVATIVE MANAGEMENT OF CONTACT VERSUS NON-CONTACT ANTERIOR CRUCIATE LIGAMENT RUPTURES IN TWINS – A PROSPECTIVE CASE STUDY OF SUPERVISED PHYSIOTHERAPY

**Jhala P<sup>1</sup>**, Mills K<sup>1</sup>, Fuller J<sup>1</sup>

<sup>1</sup>*Macquarie University, Macquarie University, Australia*

**Aim:** To compare the impact of conservative management for anterior cruciate ligament ruptures sustained through contact or non-contact mechanisms.

**Design:** Prospective case study.

**Method:** Two 25-year-old twin brothers sustained anterior cruciate ligament ruptures (one contact and one non-contact mechanism) during senior division competitive soccer on the same day in late October 2018. Both participants were managed conservatively with supervised physiotherapy. Lower limb strength (hand-held dynamometry), range of motion (goniometry) and several questionnaires were assessed at baseline. Achievement of major rehabilitation milestones and adverse events were monitored. Additionally, three-dimensional motion analysis is taking place at six-month re-assessment post-injury.

**Results:** At baseline, the participant who sustained a contact injury demonstrated increased levels of disability (30-70%) and fear (34%) as measured by the questionnaires. Additionally, they demonstrated notably decreased hip strength (32-56%) on the affected side compared to the non-contact participant. Within five months, both participants had decidedly improved and returned to full training and previous levels of activity participation.

**Conclusion:** This case study demonstrated a favourable outcome with a return to previous level of participation, when conservative management was employed for both contact and non-contact anterior cruciate ligament ruptures in twin brothers.

**Key Practice Points:**

- Conservative management was a feasible option for both participants in this case of contact and non-contact anterior cruciate ligament ruptures, despite notable differences in baseline disability and fear.
- Supervised rehabilitation could be considered in the management of anterior cruciate ligament ruptures and provide athletes with more guidance during rehabilitation.

## SMARTPHONE APPLICATIONS FOR RANGE OF MOTION ASSESSMENT IN CLINICAL PRACTICE: A QUALITATIVE REVIEW

**Job S<sup>1</sup>**, Mussig J<sup>1</sup>, Pomeroy C<sup>1</sup>, Russell M<sup>1</sup>, Smith J<sup>1</sup>, Obst S<sup>1</sup>

<sup>1</sup>*Central Queensland University, Bundaberg, Australia*

**Objective:** To systematically identify and review the quality and clinical utility of range of motion smartphone applications using the Mobile Application Rating Scale and mHealth Application Clinical Utility Scale respectively.

**Design:** Systematic review (mHealth applications).

**Method:** A search of application online stores (iTunes, Google Play) was conducted following Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Overall quality of the applications was assessed using the Mobile Application Rating Scale (engagement, functionality, aesthetics, information quality and subjective subscales). The mHealth Application Clinical Utility Scale was developed to assess evidence-base and clinical utility (generalisability, normative values, data sharing, data saving, security, availability, cost).

**Results:** Of the 5619 applications identified, 15 met inclusion criteria and were independently assessed. The Mobile Application Rating Scale mean (SD) quality score was 3.5/5 (0.4) and subjective score was 15.9/20 (4.1). The mHealth Application Clinical Utility Scale mean (SD) score was 1.0/3 (0.5). A moderate correlation between the Mobile Application Rating Scale and mHealth Application Clinical Utility Scale tools was found ( $r=0.33$ ).

**Conclusion:** The overall quality of the included applications was high, however clinical utility was limited.

**Key Practice Points:**

- Range of motion smartphone applications offer an alternative to manual goniometry, with added functionality that may improve clinical practice.
- Future mHealth applications should be designed with clinical practice in-mind, with consideration of security, generalisability and clinometric properties.
- A standardised mHealth application rating scale is required to support clinicians in selecting mHealth applications that are evidence-based and support safe and effective clinical practice.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander People:** Range of motion applications utilising camera goniometry may be advantageous to telehealth practices, enabling range of motion assessment when healthcare access is limited.

## ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION SURGERY: HAMSTRING VERSUS QUADRICEPS TENDON AUTOGRAFT

**Johnston P<sup>1</sup>**, Feller J<sup>2</sup>, McClelland J<sup>1</sup>, Webster K<sup>1</sup>

<sup>1</sup>La Trobe University, Bundoora, Melbourne, Australia, <sup>2</sup>OrthoSport Victoria, Melbourne, Australia

**Aim:** To compare early recovery following primary anterior cruciate ligament reconstruction using either quadriceps tendon or hamstring tendon grafts six months after surgery.

**Design:** Matched-group design.

**Method:** 37 quadriceps tendon patients matched for gender, age and pre-injury activity level with 74 hamstring tendon patients. Six months assessment included patient reported outcome measures (IKDC, KOOS-QOL, ACL-RSI, Marx activity), functional testing (range of motion, KT-1000 side-side differences in anterior knee laxity, single and triple crossover hop tests) and strength testing of the quadriceps and hamstrings. Independent samples t-tests were used to compare data between groups.

**Results:** No significant differences between the two groups for any patient reported outcome measures (IKDC, KOOS-QOL, ACL-RSI, Marx activity). Functional testing showed only significant differences between the two groups for reduced active ( $p < 0.001$ ) and standing knee flexion ( $p < 0.001$ ) in the hamstring tendon group. Strength testing identified deficits in limb symmetry indices for both isometric hamstring peak torque ( $p < 0.001$ ) and concentric hamstring peak torque at 60deg/sec ( $p = 0.013$ ) in the hamstring tendon group. Greater deficits in limb symmetry indices for quadriceps peak torque at 60deg/sec ( $p < 0.001$ ) and 180deg/sec ( $p = 0.002$ ) were seen in the quadriceps tendon group.

**Conclusion:** Early recovery is comparable between both grafts in terms of patient reported outcome measures. Functional and strength testing differences at six months between quadriceps tendon and hamstring tendon grafts link with the location of graft harvest.

Key Practice Points:

- Quadriceps tendon graft is comparable to hamstring tendon graft.

## STRATEGIES TO INTEGRATE WORK-FOCUSED CARE INTO MUSCULOSKELETAL PHYSIOTHERAPY PRACTICE

Johnston V<sup>1</sup>

<sup>1</sup>RECOVER Injury Research Centre, The University Of Queensland, Herston, Australia

**Aim:** To provide an overview of the evidence for different strategies physiotherapists can adopt to promote injured workers remain working productively.

**Design:** Narrative literature review

**Method:** A review of the scientific and grey literature was conducted focused on interventions that physiotherapists can adopt to promote workers to remain or return to work after an injury. Tested interventions include authorising Work Capacity Certificates, Motivational Interviewing; Early Work-focused Dialogue, Psychosocial coaching intervention and Functional Capacity Assessments (performance based or interview).

**Results:** Elements effective for positive work outcomes include structured early discussions about work; client-centred focus, determining and addressing barriers for work and communication with relevant parties. Evidence for the positive impact of physiotherapists authorising Work Capacity Certificates, undertaking Motivational Interviewing; Early Work-focused Dialogue, Psychosocial coaching intervention and Functional Capacity Assessments exists. Potential barriers for physiotherapists acquiring and integrating the new skills varies with each intervention and will be discussed.

**Conclusion:** There is a call nationally and internationally for physiotherapists to incorporate discussions about work in the management of compensable musculoskeletal injuries. Several strategies are available to physiotherapists which can be incorporated with minimal additional training.

Key Practice Points:

- Evidence-based strategies to facilitate work focused physiotherapy are available
- Physiotherapists can integrate discussions about work as part of usual care to enable their patients to remain or return to work with a musculoskeletal injury.

## SERVICE PRIORITISATION: CAN THE AGES AND STAGES QUESTIONNAIRE IDENTIFY YOUNG CHILDREN WITH GROSS MOTOR DIFFICULTIES WHO MOST REQUIRE PHYSIOTHERAPY?

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<sup>1</sup>The University Of Queensland, The University Of Queensland, Australia, <sup>2</sup>Children's Health Queensland Hospital & Health Service, Brisbane, Australia

**Aim:** To determine if the Ages and Stages Questionnaire 3rd Edition Gross Motor domain (ASQ-3-GM) is predictive of motor performance on the Alberta Infant Motor Scale (AIMS) and/or Neuro Sensory Motor Developmental Assessment (NSMDA).

**Design:** Predictive validity

**Methods:** Participants were 84 children aged 0-5 years (24.9±18.4 months; 50 males) referred for physiotherapy assessment in a tertiary child development service. Parents completed the ASQ-3 questionnaire and children were assessed using the AIMS (if 0-18 months) and/or NSMDA (all children). Possible relationships between the ASQ-3-GM with the AIMS or NSMDA were examined using Spearman's correlation coefficients. Validity of the ASQ-3-GM "refer for

further assessment” cut-off score for gross motor difficulties was examined using frequency distributions and crosstab analyses.

Results: ASQ-3-GM scores correlated with AIMS percentile rank ( $r=0.697$ ,  $p<0.001$ ) and NSMDA motor performance classification ( $r=-0.548$ ,  $p<0.001$ ). The ASQ-3-GM “refer” cut-off had 77% sensitivity, 91% specificity, and 95% positive predictive value (PPV) to identify children scoring  $\leq 10$ th percentile on the AIMS and 57% sensitivity, 92% specificity, and 97% PPV to identify children with at least minimal dysfunction on the NSMDA.

Conclusion: The ASQ-3-GM score is a valid predictor of AIMS percentile rank and NSMDA motor performance classification in young children referred for physiotherapy assessment.

Key Practice Points:

- The ASQ-3-GM parent questionnaire can be recommended as a screening tool to identify gross motor difficulties in a community sample
- Children who score below the “refer” cut-off are likely to have gross motor difficulties warranting further assessment.

## ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: KNEE EXTENSOR STRENGTH AND GRAFT CHOICE

Johnston P<sup>1</sup>, McClelland J<sup>1</sup>, Webster K<sup>1</sup>

<sup>1</sup>La Trobe University, Bundoora/ Melbourne, Australia

Aim: To identify differences in knee extensor strength after anterior cruciate ligament reconstruction between quadriceps tendon autografts compared with either the contralateral limb or an alternative graft type at six and twelve months following surgery.

Design: Literature review.

Method: A review of the literature was conducted, using four electronic databases searched until March 2019, for published peer reviewed studies that investigated knee extensor strength after anterior cruciate ligament reconstruction using a quadriceps tendon autograft compared with either the contralateral limb or an alternative graft type.

Results: Eight studies reported limb symmetry index or data values to calculate limb symmetry index for knee extensor strength at six months: contralateral limb ( $n = 2$  studies), hamstring tendon graft ( $n = 3$  studies), patellar tendon graft ( $n = 2$  studies), and allograft ( $n = 1$  study). Four studies reported limb symmetry index for knee extensor strength at twelve months: contralateral limb ( $n = 1$  study), hamstring tendon graft ( $n = 1$  study), patellar tendon graft ( $n = 1$  study), and allograft ( $n = 1$  study). At both six and twelve months the quadriceps tendon autograft demonstrated a lower limb symmetry index compared to both allograft and hamstring tendon grafts.

Conclusion: Knee extensor strength is reduced after quadriceps tendon autograft anterior cruciate ligament reconstruction when compared to the contralateral limb, allograft and hamstring tendon grafts.

Key Practice Points:

- Rehabilitation should focus on improving knee extensor strength.

This work was supported by an Australian Government Research Training Scholarship.

## YEAR IN REVIEW: CHRONIC BREATHLESSNESS

Johnston K<sup>1</sup>

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This ‘year in review’ session will identify key research published in the past 2 years concerning chronic breathlessness, including models of care such as breathlessness services. Presented by an experienced researcher, attendees will gain

insight as to how these studies might influence practice, and future challenges and directions in this field. Year in review sessions are a brief but effective way to be orientated to current research from across the world and understand the evidence base for clinical practice.

## A TOOL TO IDENTIFY RISK OF NON-RETURN TO WORK FOLLOWING A ROAD TRAFFIC CRASH: A SCREENING TOOL

Smits E<sup>1</sup>, Brakenridge C<sup>1</sup>, Gane E<sup>1,2,3,4</sup>, Warren J<sup>5</sup>, Heron-Delaney M<sup>6,7</sup>, Kenardy J<sup>8</sup>, **Johnston V**<sup>1</sup>

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**Aim:** To develop a tool to identify risk of non-return to work following minor to moderate injuries sustained in a road traffic crash.

**Design:** Secondary analysis of a longitudinal cohort study using data collected at approximately 6 and 24 months post-crash.

**Method:** Participants were claimants (n=194; Mean age=47 years; 63% female) with mild to moderate injuries who were working before their crash. They were recruited through the common-law 'fault-based' compulsory third party scheme in Queensland, Australia. Sociodemographic, functional and psychological health outcomes (142 items) were collected at baseline and used as potential predictors for non-return to work at 2 years. For comparison, predictive performance was also determined for the short form Orebro Musculoskeletal Pain Questionnaire.

**Results:** Statistical modelling identified six items to predict non-return to work, which were used to develop the tool. The tool showed good predictive power (AUC=0.85) and high sensitivity (81%), which was similar to the predictive power (AUC=0.86) and sensitivity (81%) of the Orebro in this cohort.

**Conclusions:** This study presents a brief tool to identify individuals at risk of non-return to work post-crash. The tool has similar predictive performance as the Orebro, but contains less items.

### Key Practice Points:

- This brief screening tool can be used to identify those at risk of non-return to work.
- Physiotherapists are crucial to achieving return to work after traffic accidents for many clients.
- Identifying those at risk of non-return to work may help physiotherapists set appropriate goals with clients and to guide treatment.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:**

The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## INSTRUMENTED MEASUREMENT OF MUSCLE MECHANICAL PROPERTIES IN CHILDREN WITH ATYPICAL MUSCLE STRUCTURE OR FUNCTION: A SYSTEMATIC REVIEW

Goo M<sup>1</sup>, **Johnston L**<sup>1</sup>, Hug F<sup>2</sup>, Tucker K<sup>1</sup>

<sup>1</sup>The University Of Queensland, Brisbane, Australia, <sup>2</sup>The University of Nantes, Nantes, France

**Aim:** To identify instrumented devices that quantify skeletal muscle mechanical properties, and evaluate their psychometric evidence and potential clinical utility for children.

**Design:** Systematic Review

**Method:** Four databases were searched to identify articles reporting original psychometric data for devices measuring muscle stiffness, elasticity and/or viscoelasticity, along a muscle's main axis. Psychometric evidence was rated using the COnsensus-based Standard for the selection of Measurement Instruments (COSMIN) checklist.

**Results:** Searches yielded 589 articles, of which 57 provided psychometric data for two devices that met our criteria, including the Aixplorer® and Acuson S3000/S2000. Both are Shear Wave Elastography (SWE) techniques that determine the shear modulus of muscle tissue, as an index of muscle elasticity. The Aixplorer® demonstrated strong construct validity and reliability. The Acuson demonstrated moderate construct validity (S2000) and reliability (S3000). Both devices have strong clinical utility for children, since administration is non-invasive with no discomfort, applicable is possible at various joint positions without modification of hardware, and data is acquired in real-time, minimizing fatigue and attention requirement.

**Interpretation:** Shearwave Elastography has moderate (Acuson) to strong (Aixplorer®) psychometric evidence with sound clinical utility for measuring muscle mechanical properties in children.

**Key Practice Points:**

- Instrumented measurement of muscle mechanical properties is needed to improve diagnostic, prognostic and treatment outcome assessment for children
- Shearwave Elastography is valid and reliable for measurement of muscle mechanical properties in children
- Research is warranted to evaluate utility of Shearwave Elastography for children with specific disorders of muscle structure and function.

## **‘SCHOOL READINESS’: WHAT DOES THIS MEAN FOR CHILDREN, FAMILIES, SCHOOLS AND HEALTH PRACTITIONERS?**

**Johnston L<sup>1</sup>**

<sup>1</sup>*The University of Queensland, Brisbane, Australia*

### **Background**

Each year, approximately 300,000 babies are born in Australia. Between 4-5 years later, these children enter schooling, in what the Australian Curriculum refers to as the ‘Foundation’ year. Across states, this year may be termed ‘Kindergarten’, ‘Preparatory’ or ‘Year 1’. Either way, performance expectations are set by the Australian Curriculum. Participation and performance of young children in learning areas included in the Foundation Year is critical for early and future learning, especially for the nearly 10% of children who have had prior growth and/or developmental issues, associated with genetic conditions, or perinatal or postnatal health events. Difficulties these children experience in meeting academic performance standards has raised substantial concern with parents, educators and health practitioners in relation to the question of ‘School Readiness’. Physiotherapists can play key role in assessment and management of school readiness, and promote broader understanding of this concept.

### **Objectives**

This keynote will

- Describe the continuum of ‘School Readiness’ and common difficulties experienced by children within a model of physical, social, emotional and/or cognitive performance. These difficulties have been shown to be strongly associated with later educational failure/underachievement. In some populations, educational disadvantage and social-emotional difficulties persist into adult life as mental health problems (predominantly anxiety and depression) and reduced economic potential.
- Describe a bio-psycho-social participation-focused model that considers not just child ‘readiness’, but ‘readiness’ of the child’s environment, as it relates to family, school and community (including physiotherapy). The model highlights the ‘Early-years’ as a window of opportunity to improve participation, academic performance and quality of life at school. This may alter a child’s life trajectory to reduce life-long disadvantage and produce significant personal and societal benefits.

- Present an example of an inter-professional 'School Readiness' program and potential practice applications for physiotherapists.

#### Key Practice Points:

- 'School readiness' is achieved over a continuum, not a point in time.
- Rather than a single construct, it is multifactorial.
- Evaluation and facilitation of school readiness includes the child, but also readiness of the environment surrounding the child – their family, school and community.
- Physiotherapists can be key facilitators of school readiness for children with a range of disabilities

## ERGONOMICS OR EXERCISE: DO THEY WORK FOR COMPUTER USERS WITH NECK PAIN?

Johnston V<sup>1</sup>

<sup>1</sup>The University of Queensland, Brisbane, Australia

**Aim:** To compare a workplace-based ergonomics plus exercise versus ergonomics plus health education intervention on work productivity and neck pain in office workers.

**Design:** Two-arm one year prospective cluster randomised trial (ACTRN#12612001154897).

**Method:** 763 office-based employees with and without a history of neck pain were randomly allocated to receive a progressive neck specific exercise program three times per week (n=381) or weekly health education information sessions (n=382) for 12 weeks. Both groups received an individualised workstation assessment and intervention prior to allocation. All interventions were conducted in the workplace during work hours. Data was collected at baseline, 12 weeks and 12 months. Health-related productivity loss due to sickness absences and impaired work performance was estimated with the Health and Work Performance Questionnaire. Severity of neck pain during the last seven days was recorded with a 10-point Numerical Rating Scale. Generalised linear models investigated the impact of the interventions on outcomes.

**Results:** Monetized productivity loss and presenteeism at 12 months was lower in the exercise group ( $p < 0.023$ ) for the general population. For office workers with neck pain, exercise participants had lower sickness absenteeism at 12 months ( $p = 0.012$ ). Significant and clinically relevant reductions ( $>30\%$ ) in neck pain were observed in the general population. For those symptomatic at baseline, the reduction in neck pain was maintained at 12 months. No between group differences were observed.

**Conclusion:** A combined workplace intervention involving neck-specific exercise demonstrated productivity benefits. However, exercise and ergonomics are insufficient to reduce neck pain in office workers in the short or long-term.

## PAEDIATRIC COMPETENCIES OF PRE-REGISTRATION PHYSIOTHERAPY PROGRAMS IN AUSTRALIA

Jones T<sup>1</sup>, Baque E<sup>1</sup>, Bialocerkowski A<sup>1</sup>

<sup>1</sup>Griffith University, Gold Coast, Australia

**Aim:** To describe perspectives of paediatric physiotherapy clinical educators on contemporary curricula for Australian pre-registration physiotherapy programs.

**Design:** Online survey.

**Method:** Physiotherapy clinical educators, with at least one year experience in paediatrics ( $n = 27$ ), completed an online survey, based on The Section of Paediatrics of the American Physical Therapy Association domains. It contained 35 items covering core competencies, health conditions, assessment and intervention. Participants rated the importance of including each item in the curriculum. A threshold level of  $>50\%$  of participants selecting a content area as important



was set for quantitative analysis. Open-ended questions provided further detail explaining participants' choices. Content analysis was used to identify main themes.

Results: Content on conditions including Cerebral Palsy (77.8%); Cystic Fibrosis (74.1%) and Prematurity (74.1%) were highly rated by most participants to include in a pre-registration program. Exercise prescription (81.5%), goal-directed training (63%) and group based physiotherapy (63%) were the highest rated interventions. Outcome measures considered important to include were the Alberta Infant Motor Scale (70.4%) and Goal Attainment Scaling (63%). Movement skills and the ability to interpret examination findings were considered appropriate to be taught in clinical settings. Thematic analyses indicated that students should demonstrate knowledge and skills on relevant frameworks and work with a range of paediatric populations.

Conclusion: The results highlighted contemporary paediatric content to include in pre-registration physiotherapy programs. Students need to develop theoretical knowledge on frameworks, human development, movement skills, paediatric conditions, exercise prescription and outcome measurement and have face-to-face experiences with children.

Key Practice Points:

- Recognising scope of practice for student and new-graduate physiotherapists.
- Improving referral to dedicated paediatric physiotherapists is appropriate.

## PSYCHOMETRIC PROPERTIES OF THE HIP-RETURN TO SPORT AFTER INJURY SCALE (SHORT FORM) FOR EVALUATING PSYCHOLOGICAL READINESS TO RETURN TO SPORT

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Aim: To evaluate reliability, validity, responsiveness, and interpretability of the Hip-Return to Sport after Injury Scale (short-form) to assess psychological readiness to return to sport post following hip-arthroscopy.

Design: Psychometric analysis within a cohort study.

Methods: Seventy-seven participants 1-24 months post-hip arthroscopy (age, 35±9 years, females 62%), and 33 healthy controls (age, 37±7 years, females 52%) were included. Hip-arthroscopy participants completed the scale on three occasions (at baseline, 1-week, 6-months) and healthy controls at baseline. Participants were also asked about sport participation and perceived post-surgical change. Minimal detectable difference, discriminant validity, floor and ceiling effects, responsiveness and interpretability (minimally important change) were calculated.

Results: The scale was found to have excellent test-retest reliability (Intraclass Correlation Coefficient =0.869, 95% CI: 0.756 to 0.932) with a minimal detectable difference of 26 points out of 100 (individual level) and 4 points (group level). At baseline, discriminant validity was evident between those who had returned to sport (median score=69, n=35) and those who had not returned to sport (median=30, n=42) (Mann-Whitney U Score=232.5; z=-5.141; p<0.001) and healthy controls (median 96; n=33) (Mann-Whitney U Score=165.500; z=5.666; p<0.001). No floor or ceiling effects were evident. Responsiveness was demonstrated over time in relation to sport status (returned or not returned to sport).

Conclusion: The scale is a reliable and valid measure of psychological readiness to return to sport post hip-arthroscopy.

Key Practice Points:

- The Hip-Return to Sport after Injury Scale (short-form) provides a useful and easily-administered tool for practitioners to assess psychological readiness to return to sports

## THE REPRODUCIBILITY AND RESPONSIVENESS OF SUBJECTIVE ASSESSMENT OF UPPER-LIMB ASSOCIATED REACTIONS IN PEOPLE WITH ACQUIRED BRAIN INJURY DURING WALKING

**Kahn M<sup>1,2</sup>**, Clark R<sup>2</sup>, Bower K<sup>3</sup>, Mentiplay B<sup>4</sup>, Olver J<sup>1,5</sup>, Williams G<sup>1,3</sup>

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**Aim:** To determine the inter-rater, test-retest and intra-rater reliability and responsiveness of the International Classification of Functioning, Disability and Health Framework's 'Qualifier's Scale' applied to rating global and individual upper-limb joint severity and visually-estimated elbow flexion angle during walking.

**Design:** Observational study

**Method:** Forty-two people with brain injury with arm associated reactions and five healthy controls were videoed walking on two occasions under two conditions (self-selected and fast). Videos were viewed by three experienced neurological physiotherapists who rated global and individual upper-limb joint severity (0-4) using the 'Qualifier's Scale' and visually-estimated elbow flexion angle. Intra-class correlation coefficients (ICC) were calculated for reliability, and Cohen's 'd' effect sizes were calculated for effort-dependent arm change from self-selected to fast-walk for responsiveness.

**Results:** Test-retest and intra-rater reliability were very strong (ICC > 0.8), and inter-rater reliability was strong (ICC > 0.6). The elbow joint (angle and severity) had the largest effect size between walking speeds (0.54), followed by global (0.53) and shoulder (0.45) scores.

**Conclusion:** The Qualifier's Scale and elbow flexion angle had strong to very strong reliability. The global, elbow and shoulder joints were most responsive. This subjective scale can be used by clinically to quantify associated reactions during walking.

**Key Practice Points:**

- The Qualifier's Scale and elbow flexion angle are clinically-feasible and can be reliably used by clinicians to subjectively quantify upper-limb associated reactions during walking.
- Motion analysis may be useful to determine the key kinematic features of associated reactions and determine the accuracy and validity of subjective rating.

## KINEMATIC FEATURES OF UPPER-LIMB ASSOCIATED REACTIONS DURING GAIT IN PEOPLE WITH ACQUIRED BRAIN INJURY

**Kahn M<sup>1,2</sup>**, Clark R<sup>2</sup>, Williams G<sup>1,3</sup>, Bower K<sup>4</sup>, Olver J<sup>1,5</sup>, Mentiplay B<sup>4</sup>

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**Aim:** To report the kinematic features of upper-limb associated reactions during walking in adults with acquired brain injury (ABI).

**Methods:** Forty people with ABI with upper-limb associated reactions and 36 healthy controls were recruited. As associated reactions are effort dependent, all participants underwent three-dimensional motion analysis at a fast-walking speed. Mean, standard deviation, maximum, minimum and total joint range-of-motion were captured for the upper-limb joint axes. Summary statistics were generated for key kinematic variables and between-group comparisons performed using independent t-tests.

**Design:** Observational Study

Results: The ABI group (majority left hemiplegic, 61.9%) walked slower (1.3m/s) than the controls (2.2m/s;  $p<0.01$ ). The ABI group walked with more elbow flexion, yet a smaller total range-of-motion ( $p<0.01$ ). The ABI group walked with less shoulder flexion and a smaller total range-of-motion ( $p<0.01$ ), and also had greater shoulder abduction and internal rotation ( $p<0.01$ ). There were no significant differences between the cohorts for forearm rotation or wrist flexion.

Conclusion: This is the first study specifically quantifying the kinematics of upper-limb associated reactions during gait. Consideration must be given to the mean position and total range-of-motion for each joint when describing associated reactions as they may be differentially affected.

Key Practice Points:

- Kinematic abnormalities during fast walking were more prevalent in the shoulder and elbow than the wrist and forearm.
- The associated reactions were multiplanar and were evident by their mean position, and the total range-of-motion.

## SUBJECTIVE RATING OF ASSOCIATED REACTIONS OF THE ARM DURING WALKING IN PEOPLE WITH ACQUIRED BRAIN INJURY

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Aim: To quantify therapists' subjective rating of associated reactions and the prevalence of joint involvement

Design: Observational study.

Method: Forty people with acquired brain injury and associated reactions were videoed during fast walking. Three experienced neurological physiotherapists viewed the videos and rated global and individual arm joint severity (0-4) using the International Classification of Functioning and Disability's 'Qualifier's Scale'. The prevalence of therapists' scores for each outcome were calculated. The relationship between the global and individual joint severity scores were analysed using correlation coefficients.

Results: All the arm joints were implicated. The elbow joint was most frequently rated as at least moderately severe (i.e.  $\geq 2$ ; 84.2%), followed by the fingers (65.8%), forearm (42.5%), shoulder (40.8%) and wrist (25.0%). Other upper-limb joints were rated as severe, or more severe, than the elbow in 42.9% and 27.5% of ratings respectively. There was a strong-very strong correlation between the global and elbow severity scores for each therapist ( $r > 0.76$ ;  $r^2 > 0.57$ ;  $p < 0.01$ ).

Conclusion: All the major joints of the arm are affected by associated reactions during fast walking. Given the frequency with which all upper-limb joints were rated at least moderately severe, assessment should consider all the upper-limb joints.

Key Practice Points:

- Associated reactions may affect all upper-limb joints
- All arm joints require evaluation to accurately measure associated reactions
- Three-dimensional motion analysis may be useful to establish the characteristic kinematic features of associated reactions

## FUNCTIONAL NEUROLOGICAL DISORDERS

**Kanaan R<sup>1,2</sup>**

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Functional Neurological Disorders are among our oldest recognised disorders, and have attracted the attention of many of medicine's greatest minds. Despite this illustrious history, they remain surprisingly mysterious. There is no agreement on what kind of a disorder they are, how common they are, or why they develop. For much of medicine they represent a unique challenge, for though they are undoubtedly common, and unquestionably disabling, few have the desire or the knowledge to treat them - indeed, how we should treat them is one of our biggest unanswered questions. There has been renewed interest in the field in recent decades, however, and I shall present some of the progress made on all of these questions, including the growing understanding of the role of physiotherapy.

### Key Practice Points:

- Recent developments in the aetiology, mechanism and treatment of Functional Neurological Disorder will be presented
- An outline of the role and principles of physiotherapy in Functional Neurological Disorder

## EFFECTIVENESS OF PHYSIOTHERAPY TREATMENTS FOR SEXUAL DYSFUNCTION IN MEN AFTER PROSTATECTOMY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Aim:** To evaluate the efficacy of pelvic floor muscle training alone and in combination with adjunct therapies for postprostatectomy erectile dysfunction and climacturia.

**Design:** Systematic review with meta-analysis.

**Method:** An electronic search of multiple databases was conducted from inception to February 2018. Randomised controlled trials comparing pelvic floor muscle training alone and in combination with electrical stimulation or biofeedback to control were included in the review.

**Results:** One-hundred and twenty-seven trials were identified and seven had data that could be included in a meta-analysis. The pooled analysis of studies comparing pelvic floor muscle training plus biofeedback with no treatment control revealed a significant effect of the intervention on erectile function (RR, 3.65, 95% CI 1.02 to 13.05,  $p = 0.05$ ). Data from one study found statistically significant effect of pelvic floor muscle training combined with electrical stimulation on Climacturia (RR 15.60, 95% CI 0.95 to 254.91,  $p = 0.05$ ). There was no effect of pelvic floor muscle training alone on erectile function (RR 0.96, 95% CI 0.85 to 1.07,  $p = 0.44$ ) or Climacturia (RR 1.01, 95% CI 0.96 to 1.07,  $p = 0.65$ ).

**Conclusion:** Pelvic floor muscle training in combination with biofeedback improves erectile dysfunction in men after prostatectomy. Data from a single study found pelvic floor muscle training combined with electrical stimulation to be beneficial for climacturia.

### Key Practice Points:

- Pelvic floor muscle training augmented with biofeedback is beneficial for improving post-prostatectomy erectile dysfunction.
- Pelvic floor muscle training combined with electrical stimulation improves climacturia in men after prostatectomy.

## SCREENING, SCANS AND CHOOSING WORDS CAREFULLY: OPTIMISING CARE FOR PATIENTS WITH LOW BACK PAIN

**Karran E<sup>1</sup>**

<sup>1</sup>University of South Australia, Adelaide, Australia

The effective clinical management of patients with low back pain presents an ongoing challenge for healthcare providers in all settings. In this presentation, Emma will present her recent research findings addressing areas of uncertainty related to the clinical management of low back pain, leading to practical suggestions for optimising care. She will report on the clinical value of using low back pain screening tools for providing prognostic information and discuss the need for broad integration of a management approach that minimises harm and provides high quality information. Whilst a do-no-harm approach would in most instances involve avoidance of imaging for non-specific low back pain, results will be presented from two studies suggesting the potential for carefully considered interpretations of spinal imaging findings to be reassuring. A tested framework for discussing the results of imaging and a series of patient information sheets for communicating activity-promoting messages will be demonstrated.

### Key Practice Points:

- Attendees will develop a deeper understanding of current evidence surrounding the clinical utility of low back pain screening and the potential harms and opportunities of spinal imaging.
- This session will provide examples of communication strategies and resources that can be readily integrated into clinical consultations to enhance care.

## RADIOGRAPHIC ASSESSMENT OF PATIENTS WITH PATELLOFEMORAL PAIN AND PATELLOFEMORAL OSTEOARTHRITIS

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**Aim:** Recent literature has suggested that patellofemoral pain (PFP) may be predictive of patellofemoral osteoarthritis (PFOA). Studies have shown that patterns of pain are similar in both conditions. This study aimed to i) compare radiographic changes in both PFP and PFOA. ii) Explore correlations between radiographic changes and the severity of PFOA

**Design:** Controlled cohort study

**Method:** Forty patients referred for physiotherapy participated in this study, (26 females and 14 males, mean-aged 46). Eighteen were bilaterally affected making the comparison between 58 knees, 29 with PFP and 29 with PFOA. From skyline x-ray views alignment and stability measures were calculated. Alignment measures included Insall-Salvati ratio, modified Insall-Salvati ratio, angle of patella tilt, lateral patella displacement. Stability measures included congruence angle, sulcus angle, trochlear depth. Comparative analyses and Pearson's correlations were performed.

**Results:** Significant differences between groups were found for congruence angle ( $p=0.001$ ) and lateral patellar displacement ( $p=0.002$ ). There was a marked similarity between groups for abnormal patella tilting (8.17 degrees for patients with PFP and 8.76 for PFOA) and for the number of patients in each group with both abnormal patella tilting and Insall-Salvati ratios. Patients with PFOA showed a high correlation between severity of PFOA and lateral displacement of the patella, Insall-Salvati ratio, patellar tilt and congruence angle (all  $p=0.001$ )

**Conclusion:** Patients with PFP and PFOA share similarities in abnormally increased patella tilt and this may be predictive of PFOA. As PFOA increased in severity there were changes in all 3 alignment measures and the congruence angle.

#### Key Practice Points:

- Radiology may detect some characteristics that predict which patients may develop PFOA as well as the progression to PFOA
- Although not routinely required when treating PFP, radiology may provide new knowledge regarding which patients require ongoing education and treatment to delay PFOA.

## PHYSIOTHERAPISTS INVOLVED IN THE CARE OF PATIENTS WITH MAJOR NEUROLOGICAL INJURY POST-HOSPITAL DISCHARGE HAVE TRANS-DISCIPLINARY ROLES

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**Aim:** To investigate allied health provider perceptions of physiotherapist roles in managing serious neuro-trauma following hospital discharge to rural and urban Victoria.

**Design:** Qualitative study with thematic analysis.

**Methods:** 15 semi-structured interviews with physiotherapists and allied health professionals from various Victorian geographic regions who treat patients with traumatic neurological injury were completed.

**Results:** Physiotherapists were involved in goal-based therapy with patients within a multi-disciplinary team. Participants reported the primary roles of physiotherapists across rural and urban regions to be patient advocacy, family/carer training, equipment provision, return to leisure activities and community mobility. Reported barriers to effective physiotherapy service provision included restricted time to provide therapy, extensive psychological support for patients that physiotherapists did not feel equipped to provide and patients' behavioural issues which limited engagement. Clinicians reported that in rural areas, the scope of physiotherapists was broader due to an absence of other appropriate services such as recreational therapy.

**Conclusion:** Physiotherapists working with people following neuro-trauma undertake a number of additional, challenging roles, other than traditional physical rehabilitation. These roles are transdisciplinary and include patient advocacy, counselling, case management and family/carer training.

#### Key Practice Points:

- Physiotherapists involved in rehabilitation of people with neuro-trauma provide multi-faceted care whilst working in a multidisciplinary team.
- Both traditional and non-traditional elements of physiotherapy must be considered when establishing patients' therapy needs to optimise outcomes.
- Given the challenges that exist in managing these patients, sufficient clinical and non-clinical support should be provided to clinicians to enhance service provision and ensure physiotherapist wellbeing.

## IT DOESN'T NEED TO BE THE "END OF THE ROAD". HIP FRACTURE REHABILITATION FOR FRAIL, OLDER PEOPLE LIVING IN NURSING CARE FACILITIES (NCFs): THE GAP BETWEEN WHAT THEY GET AND WHAT THEY NEED

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**Aims:** 1. To present results from a randomised control trial (RCT) investigating whether post-operative ortho-geriatric rehabilitation delivered in the NCF improved mobility and quality of life compared to receiving usual care for a group of residents who were walking independently prior to hip fracture.

2. To describe the routine care, and the alternative in-reach rehabilitation provided to this complex cohort.

**Methodology:** 240 people from nursing care facilities recovering from hip fracture were randomly allocated to receive either a 4 week low intensity rehabilitation program or usual care. The primary outcomes were mobility (Nursing Home Life Space Diameter NHLSD) and quality of life (DEMQOL) at 1 month and 12 months. Family members and nursing home staff of 28 out of the first 30 participants (14 from usual care and 14 from intervention) participated in interviews and focus groups to provide information and perceptions of each person's journey following hip fracture.

**Results:** At 4 weeks, the treatment group had better mobility (NHLSD mean difference -1.9; 95% CI:-3.3,-0.57; p=0.0055) and were more likely to be alive (log rank test p=0.048) but with no differences in quality of life. At 12 months the treatment group had better quality of life (DEMQOL sum score mean difference = -7.4; 95% CI:-12.5 to -2.3; P=0.0051), with no other differences between treatment and control groups. Family members and NCF staff reported better pain management, earlier mobilisation and less despondency in those participants who received in-reach rehabilitation. While most residents received some physiotherapy over the 4 weeks as part of routine care, it was less than 30 minutes a week. Those allocated to the treatment arm received thirteen hours of rehabilitation input, including 10.6 hours of physiotherapy.

**Conclusion/Key Practice Points:**

- It is possible to engage NCF residents in ortho-geriatric rehabilitation post hip fracture.
- Survival and functional benefits were seen at 4 weeks but did not persist once the rehabilitation program ended.
- Clinical guidelines for this complex cohort need to be developed.

## INCREMENTAL STEP TEST RESULTS ARE RELATED TO THE SIX-MINUTE WALK DISTANCE IN ADULTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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**Aim:** To examine the association between total step count achieved during an incremental step test (IST) and distance walked during a six-minute walk test (6MWT) in people with chronic obstructive pulmonary disease (COPD).

**Design:** Prospective, multi-centred, observational study.

**Methods:** People with COPD who had completed a pulmonary rehabilitation assessment were recruited. All participants performed one IST (modified protocol with a metronome starting rate of 10 beat per minute (bpm) increasing by 1bpm every 30 seconds) within four weeks of completing two baseline 6MWTs. The primary outcome measure was the IST total step count. The association between the 6MWT distance and IST total step count was assessed using Pearson's correlation coefficient.

**Results:** Thirty participants (mean [SD] age 74 [7] and FEV1 58 [21] % predicted) completed the study. The average (mean [SD]) IST time was 323 (113) seconds and total number of steps being 86 (40). The mean 6MWT distance was 462 (94) metres. A strong positive correlation was found between the total step count and 6MWT distance ( $r = 0.82$ ,  $p < 0.001$ ).

**Conclusion:** The strong association between IST total step count and 6MWT distance suggests that the IST may be a feasible substitute for the 6MWT in assessing exercise capacity in people with COPD.

**Key Practice Points:**

- There is a strong association between IST total step count and 6MWT distance in people with COPD
- When space is limited the IST may be a feasible alternative to the 6MWT to assess exercise capacity in people with COPD



Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: While not a specific outcome of this paper, finding appropriate outcome measures that can be used with limited space and resources has the potential to enhance service delivery in non-metropolitan areas

## EVALUATING THE EFFECT OF WATER-BASED EXERCISE IN PEOPLE REFERRED TO A PULMONARY REHABILITATION PROGRAM: A PILOT STUDY

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**Aim:** To evaluate the effect of water-based pulmonary rehabilitation (PR) in people referred to a PR program delivered in partnership between experienced PR and aquatic physiotherapists.

**Design:** Prospective cohort study with short-term measures.

**Method:** People attending initial PR assessment in Northern Sydney Local Health District were screened for inclusion and eligible participants were given the option of attending either water or land-based PR. Participants completed twice weekly water-based exercise sessions for eight weeks that mirrored the intensity and duration of land-based PR. Outcome measures were the six-minute walk distance (6MWD) and five sit to stand test (5-STST). Participants completed a purpose-designed survey upon completion to assess the subjective impact of the program on their exercise capacity and quality of life.

**Results:** Twenty three participants (mean, [SD]: age 72, [9], FEV1 66 [22] % predicted) have completed the study to date. There was a significant improvement in 6MWD (mean difference [95%CI] (26m [5, 47]) and the 5-STST time (-2.93 seconds [0.085, 5.95.]) Participants reported being very satisfied with the program and 90% reported noticing improvements in their exercise capacity and quality of life.

**Conclusion/Key Practice Points:**

- Water-based PR improved exercise capacity in people referred to PR
- Participants were highly satisfied with the aquatic PR program service and noticed improvements in exercise capacity and quality of life.
- Water-based PR is a feasible and effective alternative to land-based PR

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: while not specifically reviewed in this study, identifying effective novel modes of rehabilitation should improve PR completion rates which are known to be low, particularly in Aboriginal and Torres Strait Islander people.

## THE COMBINED EFFECT OF PHYSIOTHERAPY, INTRA-ARTICULAR STEROID INJECTION AND BRACING ON KNEE OSTEOARTHRITIS

Page C<sup>1</sup>, Kinsella R<sup>1,2</sup>, Quek J<sup>1</sup>, Murdoch H<sup>1</sup>, Lim K<sup>1,3,4</sup>, Cowan S<sup>2,4,5</sup>

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**Aim:** Exercise, intra-articular steroid injection and bracing have been shown to independently contribute to symptomatic improvement in people with knee osteoarthritis. Effects of combining these modalities have not been investigated. This study aimed to determine (i) the feasibility of a large trial comparing combined steroid-injection, physiotherapy and off-loader bracing in patients with medial compartment OA and (ii) treatment effects of the combined intervention compared to standard care (injection and physiotherapy).

**Design:** Randomised Controlled Trial.

**Methods:** Individuals diagnosed with medial compartment osteoarthritis were recruited from St Vincent's Hospital orthopaedic clinics from 2015-17. Primary outcome: feasibility (% of eligible participants enrolled, adherence and drop-out rates). Secondary outcomes: self-reported pain and function (Numerical Rating Score, WOMAC Index) and physical performance (strength, dynamic motion, functional testing).

**Results:** Twenty-two participants were randomised (intervention: n=12 (mean age 63.58±12.11), control: n=10 (mean age 70.00±7.23). Adherence was 81% with four lost to follow up. Both groups responded to the intervention with significantly improved change scores at 12 weeks in pain (z=2.69, p=0.01, r=.57), function (WOMAC: z=3.22, p=0.00, r=.69) and hip strength (external rotation: z=2.20, p=0.03, r=.47 and abduction: z=2.42, p=0.02, r=.52). Between-group differences were not observed.

**Conclusion:** The low study power prohibited definitive conclusions being drawn. Design modifications for future research were identified, with sub-groups of patients targeted to more effectively investigate off-loader bracing as part of a multi-modal strategy in patients with symptomatic knee OA.

**Key Practice Points:**

- The burden of knee OA is rising. Further evaluation of low risk and low cost non-surgical interventions is vital.

## PERCUTANEOUS TIBIAL NERVE STIMULATION: MANAGING OVERACTIVE BLADDER SYNDROME

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**Background:** Over 4 million Australians aged over 15 years suffer with urinary incontinence, with a yearly financial cost of nearly \$43 million. Overactive Bladder Syndrome and Urge Urinary Incontinence greatly impact our quality of life emotionally, occupation, sexual intimacy, physical activities, and financial. There are many conservative and medical options to consider for overactive bladder syndrome. One of these options include Percutaneous Tibial Nerve Stimulation. International studies have shown markedly good results, up to 60% benefit, in medically naïve patients. Furthermore, patients with symptoms refractory to medication and intravesical onabotulinum toxin, have shown to obtain benefits in up to 30-40%. Published protocols include 30- 60 minute treatment sessions on a weekly basis in the outpatient clinic setting, and followed up for 10 weeks.

**Aim:** In Australian patients where access to TENS machines are readily accessible, we hypothesize that multiple treatment sessions of Percutaneous Tibial Nerve Stimulation per week, will improve outcomes and response times.

**Approach:** A Prospective trial of PTNS for medically and surgically refractory overactive bladder patients. PowerPoint presentation for theories and trial results, and to demonstrate PTNS technique. Hands-on practice for participants. Handouts of the PowerPoint will be provided.

**Key Practice Points:**

It is expected that on completion of this session, participants will be able to:

- assess Overactive Bladder Syndrome
- Learn a new treatment option that is efficient and economical to apply in clinics and home environments.
- Use an objective measure to monitor progress of overactive bladder symptoms and guide clinical management.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples:** This research will improve the health outcomes of Aboriginal and Torres Strait Islander people who suffer from overactive bladder syndrome, where medication is difficult to obtain and expensive. PTNS is quick and easy to perform and can be readily available.

## ACTIVITY LEVELS OF PATIENTS DURING THERAPY AND NON-THERAPY TIME DURING INPATIENT REHABILITATION: A SCOPING REVIEW

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**Aim:** To examine the activity levels of patients during therapy and non-therapy time whilst in inpatient rehabilitation.

**Design:** A scoping review of papers describing the activity levels of any patient engaged in inpatient rehabilitation were included in the review.

**Method:** The Joanna Briggs Institute methodology was used to search Medline, CINAHL, and Cochrane databases using key terms covering allied health and physical activity. Studies of any design were included if they assessed the amount of activity undertaken in therapy and/or non-therapy time for inpatient rehabilitation populations.

**Results:** The majority of the 31 included papers studied stroke populations (n=24). Activity levels were monitored using Behavioural mapping, video recording and accelerometry. Therapy duration ranged from 31-64 minutes. Participants engaged in moderate-to-high therapeutic activity between 22-66% and none-to-low levels between 29-69% of therapy time. No time was spent in moderate-to-high therapeutic activity and between 94-96% in none-to-low levels during non-therapy time. Behavioural mapping and video recording studies reported that participants engaged in moderate-high levels of therapeutic activity between 6-48% and none-to-low levels between 52-85% of time across the entire day. Accelerometry studies reported that participants engaged in high levels of therapeutic activity between 2-6% across the entire day. Participants took between 63-1907 steps per day.

**Conclusion:** Patients spend approximately 95 percent of their time outside of therapy and between 29-69 percent of their time in therapy at none-to-low levels of activity. Further research is required on the barriers and facilitators to increasing activity levels in this setting.

**Key Practice Points:**

- This research highlights the need to increase duration and frequency of time patients spend active in an inpatient rehabilitation setting.
- Education and interventions aimed at increasing activity during non-therapy time may improve inpatient therapy outcomes.

**Impact Proposed on the health outcomes of Aboriginal and Torres Strait Islander people:** No specific impact.

## EFFICACY OF APP'S AND MOBILE TECHNOLOGY PARTICULARLY FOR PELVIC FLOOR HEALTH

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The growth of new technology in the healthcare space is exponential. With many people owning smart phone and tablet devices, potential interventions (guided by an app) are literally at their fingertips. There is evidence that mHealth based interventions improve health outcomes 1,2 and thereby providing an adaptable, low cost and easily accessible method to educate and improve health across population groups. However, this is limited in the area of pelvic floor muscle training. Despite this there is a plethora of apps and devices on the market, claiming to improve PFM function. A simple search of 'Kegel' or 'Pelvic Floor Muscle Training' shows up hundreds of apps in Google Play and Apple app stores. Only 11 of these have any validated research. 3

**Objectives:** This talk will focus on those app based interventions that have demonstrated efficacy and discuss how efficacy is determined. It will cover some frameworks that have been developed to assess app based interventions for health and touch on some of the regulatory requirements if the app is claiming 'treatment' benefits.

**Key Practice Points:**

- Increased knowledge of the field of app based technology as it applies to pelvic floor health.

## THE UTILITY OF THE VAGINAL PRESSURE PROFILE IN RELATION TO POP, PF MUSCLE ACTIVATION AND GENERAL EXERCISE

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**Background:** Measuring vaginal pressure has been extensively used to quantify pelvic floor muscle function. However, most of the instrumentation developed to do this relies on a detection of a pressure change regardless of how that pressure is generated. The influence of abdominal pressure on these measurements is usually ignored. Knowing a vaginal pressure profile, provides more comprehensive information, can confidently guide women on correct pelvic floor muscle activation, assess the influence of abdominal pressure during exercise, and quantify the change in the vaginal profile pre- and post-surgery for pelvic organ prolapse.

**Objectives:** This talk will focus on the how a vaginal pressure profile is measured, the instrumentation developed specifically to achieve this, and the application of the pressure profile to various scenarios. Results from preliminary work in this area will also be presented.

**Key Practice Points:**

- Knowledge on the vaginal pressure profile and its potential application.

## COGNITIVE IMPAIRMENT IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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**Aim:** To determine the incidence of cognitive impairment in people with chronic obstructive pulmonary disease (COPD).

**Design:** An observational study.

**Method:** Participants aged  $\geq 40$  years with a diagnosis of COPD, referred to pulmonary rehabilitation, were recruited. Participants underwent clinical assessments and two six-minute walk tests. Cognitive function was assessed using the Montreal Cognitive Assessment (MoCA).

**Results:** Thirty-eight participants with COPD (mean (SD) age: 72 (8) years; mean forced expiratory volume in one second (SD): 44 (17)% predicted) completed the study. Eighteen (47%) participants had cognitive impairment (MoCA score  $< 26$ ). Six-minute walk distance (6MWD) was lower in participants with cognitive impairment compared to cognitively normal (mean difference [95%CI]: 109 m [42 to 176]). A moderate correlation between MoCA score and 6MWD ( $r = 0.5$ ,  $p = 0.002$ ) was found. Participants with cognitive impairment showed significantly lower score in multiple domains of MoCA compared to those without cognitive impairment (mean difference [95%CI] executive function: 2 points [1 to 2]; attention: 2 points [1 to 2]; delayed recall: 2 points [1 to 3]).

**Conclusion:** There is a high incidence of cognitive impairment in people with COPD, who are referred to pulmonary rehabilitation. Cognitively impaired participants had a lower functional exercise capacity compared to those without cognitive impairment.

**Key Practice Points**

- Clinicians' awareness of cognitive impairment and impaired domains of cognitive function may have important implications for treatment adherence and self-management.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples:** This research outlines the incidence of cognitive impairment in people with COPD. It is not specific for Aboriginal and Torres Strait Islander people.

## OCCURRENCE OF AND TEMPORAL TRENDS IN FIDGETY GENERAL MOVEMENTS IN INFANTS BORN EXTREMELY PRETERM/EXTREMELY LOW BIRTHWEIGHT AND TERM-BORN CONTROLS

**Kwong A<sup>1,2,3</sup>**, Olsen J<sup>1,3</sup>, Eeles A<sup>1,3</sup>, Einspieler C<sup>6</sup>, Lee K<sup>1,5</sup>, Doyle L<sup>1,3,4,5</sup>, Cheong J<sup>1,3,4</sup>, Spittle A<sup>1,2,3</sup>

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**Aim:** Fidgety movements have high predictive validity for later cerebral palsy (CP) but their temporal organisation requires further understanding for assessment accuracy. This paper aims to describe the occurrence of and temporal trends in fidgety movements, and whether they differ between infants born preterm and at term.

**Design:** Cohort study

**Method:** Up to two videos were received at 12-13+6 and/or 14-16+6 weeks' corrected age of infants born extremely preterm (EP; <28 weeks' gestation) and/or extremely low birthweight (ELBW; <1000 g birthweight) or at term (37-42 weeks' gestation). Videos were scored using the Prechtl General Movements Assessment (GMA) (fidgety) and classified as normal or absent/abnormal. Infants with at least one normal GMA were classified as normal. Individual GMA trajectories were analysed over time.

**Results:** We received at least one video from 155 infants born EP/ELBW and 185 infants born at term. Overall, infants born EP/ELBW were more likely to have absent/abnormal fidgety movements than infants born at term (23% versus 3%, odds ratio [OR] 8.50 (95% confidence interval (CI) 3.48-20.8,  $p < 0.001$ ). Fewer infants born EP/ELBW and at term showed absent/abnormal fidgety movements with each week of increasing age (EP/ELBW OR 0.46, 95% CI 0.25-0.84,  $p = 0.01$ ; term-born OR 0.35, 95% CI 0.16-0.8,  $p = 0.01$ ; interaction,  $p = 0.53$ ).

**Conclusion:** Absent/abnormal fidgety movements are more prevalent in infants born EP/ELBW than at term. Fidgety movements normalise with older age both infant groups between 12-16+6 weeks' corrected age.

**Key Practice Point:**

- If only one GMA is possible, a later assessment is preferable between 12-16+6 weeks' corrected age

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The assessment of fidgety movements with our results in mind should be applied to any high-risk infants amongst Aboriginal and Torres Strait Islander people.

## WHAT ARE THE CHALLENGES POST HOSPITALISATION FOR ICU PATIENTS LIVING IN THE COMMUNITY SETTING? A QUALITATIVE STUDY

**Larkin J<sup>1</sup>**, Kinnersly E<sup>2</sup>, Granger C<sup>3</sup>, Denehy L<sup>2</sup>, Beach L<sup>1</sup>, Elsegood N<sup>1</sup>, Parry S<sup>2</sup>

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**Aim:** To explore from the patient perspective their unmet needs following an ICU admission and strategies for follow-up support.

**Design:** Qualitative study conducted in line with the consolidated reporting for qualitative studies guidelines.

**Method:** Semi-structured 1:1 interviews with 15 participants living in the community who were at least 3-months post ICU admission (median age 58 [49-68] years; 47% male; 53% surgical, 33% medical and 13% trauma admissions; 40% living in rural/regional locations). Interviews were audio-recorded, transcribed and independently crosschecked by a second researcher. Data were analysed using thematic analysis.

Results: Main challenges following hospital discharge described by participants included: physical impairments (fatigue, weakness, reduced ability to perform daily activities due to low energy); mental impairments (low mood/motivation, anxiety, vulnerability due to loss of independence) and lack of empowerment (uncertainty of recovery expectations). Participants also described mourning of the past with the dichotomy between past and present function. Most participants reported feeling neglected/forgotten by the healthcare system and a prolonged struggle to recover on their own following discharge. 92% had a significant fear of falling with self-identified changes to walking and daily activities including: avoidance of busy environments and/or adoption of energy conservation techniques to minimise fatigue. Patient recommendations for follow-up included: access to physiotherapy/psychology support either in-person or via telephone after discharge; patient empowerment through knowledge of how to exercise safely; motivation to exercise by engaging family or use of activity devices.

Conclusion: Key potential modifiable targets have been identified which may shape the field in terms of future research.

Key Practice Points:

- Ongoing significant unmet care needs post hospital discharge
- Need to examine post discharge interventions aimed at supporting physical/mental recovery

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research is not specifically focused on the health outcomes of this group.

## COMBINING LAND EXERCISE, AQUATIC PHYSIO AND MUSCULOSKELETAL PHYSIO IN A 32 YEAR OLD, HIGH FUNCTIONING WOMAN WITH CEREBRAL PALSY.

Larsen J<sup>1</sup>

<sup>1</sup>Hydrotherapy Brisbane, Aspley, Australia

A digital case history of current and past aquatic and land treatment for Belinda, a 32-year-old young woman with cerebral palsy. Her childhood involved intense and sometimes strict management however she has evolved to be a highly functioning, nearly independent young woman who has just completed a double degree at university, is hoping for work in her area of knowledge, currently works for a not-for-profit, drives a car, loves camping and concerts. She can walk with two sticks for short distances, a wheeled frame or uses a wheelchair for expediency.

For four years Belinda has self-funded aquatic physiotherapy services on a regular basis. The NDIS has allowed her to access more therapy, core supports and land exercise. At 32 Belinda is not old, but finds herself experiencing more musculoskeletal injury and pain than when she was younger. A combination of aquatic and land physiotherapy assists Belinda to be able to work and contribute to society, to manage pain, attain fitness and health goals previously thought unattainable and to stave off those ageing issues that she is more prone to.

Key Practice Points:

- Aquatic Physiotherapy provides a medium for Belinda to maintain and improve balance
- Immersion dampens down Belinda's involuntary movements and allows "land" based musculoskeletal physiotherapy techniques that are often impossible on land.
- In the appropriate pool, an Aquatic Physiotherapy prescribed deep water fitness program can see fitness and strength develop and improve. It provides variety and fun while protecting joints.
- Hydrotherapy pools should be built with varying depth to factor in height differences in clients and the aerobic benefit of deep water activity.



## FROM MANPOWER TO EMPOWER – FAMILY-ASSISTED THERAPY IN TRANSITION CARE: A QUALITATIVE STUDY

**Lawler K<sup>1,2,3</sup>**, Taylor N<sup>1,3</sup>, Shields N<sup>1</sup>

<sup>1</sup>La Trobe University, Bundoora, Australia, <sup>2</sup>University of Tasmania, Hobart, Australia, <sup>3</sup>Eastern Health, Box Hill, Australia

**Aim:** To explore the experiences of patients and family members who participated in a family-assisted therapy intervention in Transition Care.

**Design:** Qualitative study informed by an interpretive description framework.

**Method:** Thirteen patients and 18 family members of patients participated in family-assisted therapy to augment usual care, in the four-week experimental arm of a pilot randomised controlled trial. Families were trained and supported by a physiotherapist to assist with individually tailored, safe and simple activities. Semi-structured interviews at the end of the intervention period were audio-recorded and transcribed verbatim. Researchers reviewed transcripts independently and inductively defined codes, subthemes and themes. Qualitative results were triangulated with quantitative outcomes from the randomised trial.

**Results:** Subthemes related to physical and psychosocial benefits of family-assisted therapy, the complementary contribution of family, and program and contextual factors supporting this approach. The unifying theme was empowerment of families in a health care setting. These findings converged with quantitative outcomes from the randomised trial.

**Conclusion:** Although the study indicated family-assisted therapy may improve physical outcomes, the most important outcome from the participants' perspective was empowerment. Family-assisted therapy augmenting usual care physiotherapy in Transition Care was a positive experience, engaging family in a meaningful role in the health care team.

**Key Practice Points:**

- Training family members to assist with physiotherapy empowered families to contribute to patient care in a Transition Care setting, resulting in physical and psychosocial benefits
- Involving family members in physiotherapy may improve the experience of patients and families in Transition Care

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** Incorporating information from this presentation into a cultural context when working with the Aboriginal and Torres Strait Islander population is recommended.

## WHAT DO PHYSIOTHERAPISTS KNOW ABOUT DEMENTIA? AN ONLINE SURVEY OF PHYSIOTHERAPISTS PARTICIPATING IN THE UNDERSTANDING DEMENTIA MASSIVE OPEN ONLINE COURSE

**Lawler K<sup>1</sup>**, Kitsos A<sup>1</sup>, Bindoff A<sup>1</sup>, Callisaya M<sup>1,2</sup>, Doherty K<sup>1</sup>

<sup>1</sup>University Of Tasmania, Hobart, Australia, <sup>2</sup>Monash University, Melbourne, Australia

**Aim:** To understand dementia knowledge of physiotherapists, given almost one in 10 people over 65 have dementia.

**Design:** Online survey conducted as part of a massive open online course (MOOC).



Method: Participants in the Wicking Dementia Research and Education Centre's Understanding Dementia MOOC (UDMOOC) are invited to complete a pre- and post-course survey, using the reliable and valid Dementia Knowledge Assessment Scale (DKAS). A score of 45/50 represents comprehensive dementia knowledge and is typically achieved by only 10% of UDMOOC participants prior to completing the UDMOOC. DKAS scores for physiotherapists enrolled in the 2018 Understanding Dementia MOOCs are presented.

Results: 593 physiotherapists from 26 countries (417 from Australia) enrolled. Mean age was 35.5 years (SD 12.4) and 80.9% were female. The pre-course DKAS was completed by 434 physiotherapists (72.8%), with a mean score of 35.7 (SD 8.2) and 13.4% (95% CI 10.5% to 16.9%) probability of achieving the target score; an average result compared with other allied health professionals. Physiotherapists who completed the post-MOOC DKAS (n=168) increased their mean DKAS score to 46.0 (SD 4.3), with 74.4% (95% CI 67.3% to 80.4%) probability of achieving the target score.

Conclusion: Dementia knowledge for physiotherapists seeking education was low, but average compared with other allied health professionals. A large proportion of physiotherapists who completed the Understanding Dementia MOOC achieved a target dementia knowledge score.

Key Practice Points:

- Physiotherapists may benefit from further education in dementia care
- Physiotherapists can increase dementia knowledge by participating in online learning such as the Understanding Dementia MOOC

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Physiotherapists with adequate dementia knowledge will be better prepared to provide care to Aboriginal and Torres Strait Islander people, where rates of dementia are three times higher compared to the non-Indigenous population.

## FAMILY-ASSISTED THERAPY FOR OLDER PEOPLE IN TRANSITION CARE: A PILOT RANDOMISED CONTROLLED TRIAL

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<sup>1</sup>La Trobe University, Bundoora, Australia, <sup>2</sup>University of Tasmania, Hobart, Australia, <sup>3</sup>Eastern Health, Box Hill, Australia

Aim: To investigate if augmenting physiotherapy with family-assisted therapy can improve falls-related self-efficacy, activity and quality of life for patients in Transition Care, without increasing falls or caregiver strain.

Design: Pilot randomised controlled trial.

Method: Patients in Transition Care and their family members were randomised to usual care or an experimental arm including usual care and a four-week family-assisted therapy program. Family members were trained and supported by a physiotherapist to provide therapy tailored to individual patient goals. Primary outcomes were falls-related self-efficacy measured by the Short Falls Efficacy Scale-International and falls during the intervention period. Secondary outcomes included daily steps, quality of life measures, Modified Barthel Index and Modified Caregiver Strain Index.

Results: Thirty-five patients (mean age 84 years) and 20 family members participated. Observed falls rate was of borderline significance, in favour of the experimental group (incidence rate ratio 0.22, 95% CI 0.04 to 1.20). The experimental group walked a mean of 944 daily steps more than the control group (95% CI 139 to 1748) and had a significant improvement in Barthel scores. There were no between-group differences for falls-related self-efficacy, quality of life or caregiver strain.

Conclusion: Augmenting physiotherapy with family-assisted therapy for patients in Transition Care may improve daily steps and reduce activity limitation, without increasing falls or caregiver strain.

Key Practice Points:

- Family-assisted therapy may help patients in Transition Care increase daily steps and functional independence
- With training and support for family members, family-assisted therapy is likely a safe intervention for patients in Transition Care

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:  
Incorporating information from this presentation into a cultural context when working with the Aboriginal and Torres Strait Islander population is recommended.

## DOES PULMONARY REHABILITATION AGGRAVATE OR RELIEVE PAIN IN PEOPLE WITH COPD AND CHRONIC PAIN?

Lee A<sup>1,2,3,4</sup>, Butler S<sup>2</sup>, Varadi R<sup>2</sup>, Goldstein R<sup>2,3</sup>, Brooks D<sup>2,3</sup>

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Aim: This study aimed to 1) determine the effect of pulmonary rehabilitation on pain qualities, coping behavior and psychological symptoms in those with COPD and chronic pain and 2) compare the impact of pulmonary rehabilitation on exercise capacity and quality of life between individuals with COPD and chronic pain compared to those without pain.

Design: A prospective, observational study.

Methods: Participants with COPD (with and without chronic pain at initial assessment) enrolled in pulmonary rehabilitation completed exercise capacity and quality of life measures before and after the program. Those with chronic pain also completed the Brief Pain Inventory, Coping Strategy questionnaire and the Hospital Anxiety and Depression scale.

Results: Thirty-four participants with chronic pain and 34 participants without pain were included (mean±SD FEV<sub>1</sub> 46.6±18.4% predicted). In those with chronic pain, pulmonary rehabilitation did not affect pain intensity (median[IQR] 3[2-5] vs 4[2-6] points, p=0.21), coping ability (72[51-85] vs 61[51-82] points, p=0.94), anxiety (7[2-9] vs 5[3-8] points, p=0.82) or depression (4[2-8] vs 3[1-6] points, p=0.38). Both groups improved in exercise capacity (mean difference [95% CI] 17[-39 to 73] m), but those without pain had greater improvement in mastery (p=0.011).

Conclusion: In individuals with COPD and chronic pain, pulmonary rehabilitation neither worsened or reduced pain experiences, and did not affect psychological symptoms. Those without chronic pain had greater improvement in mastery.

Key Practice Points:

- Pulmonary rehabilitation does not aggravate or relieve pain in people with COPD and chronic pain.
- Those with chronic pain have less improvement in mastery following rehabilitation.

## WILL EXOSKELETONS TRANSFORM THE NATURE OF WORK? WILL THEY BECOME THE MUSCULOSKELETAL PPE OF THE FUTURE?

Legge J<sup>1</sup>

<sup>1</sup>*JobFit Systems International, Mackay, Australia*

Introduction: Exoskeletons, or wearable robotics, are appearing in scientific journals, industry publications, the media, and some workplaces as a potential 'solution' for workplace musculoskeletal injury prevention.

Acceptance of exoskeletons across industries has been variable and is still in relatively early stages of development and implementation. Australia is often seen at the forefront of safety innovation and can be early adopters of new technologies and processes. As trusted advisors to our clients we need to be informed of the pros and cons of exoskeletons for injury prevention.

Aims: To inform participants of the current state of evidence surrounding the application of exoskeletons for workplace injury prevention to enable physiotherapists to make informed recommendations to their clients.

Approach: This presentation will outline the various types of exoskeletons currently available and their intended uses, including how they can potentially reduce the load on specific muscle groups to minimise fatigue and subsequent injury.

There are several documented risks associated with their use in industry. A review of the current evidence base will be presented.

To assist potential users and purchasers make informed decisions before trial or purchase, a checklist for independent evaluation will be presented. This resource will outline several 'tool-specific' risk factors to be considered.

Key Practice Points:

- Exoskeletons are a potential tool for assisting in the prevention of workplace musculoskeletal injuries
- There is limited scientific evidence of their effectiveness for reducing injuries
- Physiotherapists consulting to industry need to provide a balanced informed view to their clients to assist with determining suitability.

Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander people  
No additional subgroup advantage identified

## DOES THE ADDITION OF VISUAL FEEDBACK INCREASE ADHERENCE TO AN UPPER LIMB EXERCISE PROGRAM IN PEOPLE WITH STROKE

Levy T<sup>1</sup>

<sup>1</sup>*Flinders University, Bedford Park, Australia, <sup>2</sup>Flinders Medical Centre-RAP Division, Bedford Park, Australia*

Aim: to determine if the addition of visual feedback, via an iPad, will increase adherence to an exercise program in people with stroke.

Design: A single-case series with ABA design (baseline, intervention and post-intervention).

**Method:** Ten participants wore two wrist accelerometers to measure duration of exercise. Participants were instructed in the GRASP program, a self-administered homework-based upper limb exercise program, and were asked to perform 60 minutes of exercise daily. After a baseline phase (1 week), participants were given an iPad which provided feedback of their performance (2 weeks). They were asked to video each exercise session. The iPad was removed during the fourth week of the program.

**Results:** Accelerometer wear-time was investigated using the two standard deviation (2 SD) band method. A statistically significant treatment effect was observed in 4 out of the 10 cases, as demonstrated by 2 successive data points occurring outside the 2 SD band during the intervention phase. Two participants showed a statistically significant reduction in performance once the iPad feedback was removed. Four participants did not improve.

**Conclusion:** Six out of 10 people enhanced their performance in response to the iPad, and there was no reduction in performance for any participant. iPad feedback was effective in the majority of people, and was safe to use. This preliminary study indicates that the use of visual feedback, via an iPad, may increase adherence to an exercise program in people with stroke.

**Key Practice Points:**

- Visual feedback may enhance exercise adherence in stroke patients.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** Interventions that increase adherence to exercise in Aboriginal and Torres Strait Islander people with stroke, particularly the population in remote areas, has the potential to improve outcomes and reduce burden of care.

## A SYSTEMATIC REVIEW OF MEASURES OF ADHERENCE TO PHYSICAL EXERCISE RECOMMENDATIONS IN PEOPLE WITH STROKE

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**Aim:** To review methods for measuring adherence to exercise in the stroke population and to evaluate measurement properties of identified tools.

**Design:** A two-phase systematic review of 8 databases; phase 1 was conducted to identify measures/tools of adherence used and phase 2 was conducted to identify studies investigating the measurement properties of these tools.

**Method:** In phase 1 articles were selected if they were published in English, included participants diagnosed with stroke (or greater than 80% of study population diagnosed with stroke), quantified adherence to exercise or physical activity recommendations, were patient or clinician reported, were defined and reproducible measures and were in patients >18 years old. In phase 2 articles were included if they explored psychometric properties of the tools identified in phase 1.

**Results:** In phase 1, 41 methods of adherence measurement were identified; log books (n=14), diaries (n=15), 'record of practice' (n=3), journals (n=1), surveys (n=3) and questionnaires (n=2). One measurement tool was identified, the Physical Activity Scale for Individuals with Physical Disabilities (n=3). In phase 2, from the 41 references identified, no measure met the eligibility criteria for inclusion based on psychometric analysis. The lack of eligible papers from Phase 2 precluded quality assessment of measurement properties.

Conclusion: Diaries and logbooks are the most frequently utilised reporting tools and this study alerts the research community to the importance of further research to inform measurement tool selection.

Key Practice Points:

- There is a lack of uniform methods of measurement of adherence to exercise in the stroke population

## AN INCREMENTAL GOAL SETTING INTERVENTION TO REDUCE SITTING TIME IN PEOPLE WITH CARDIOVASCULAR DISEASE: FEASIBILITY AND PRELIMINARY EFFECTIVENESS

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Aim: To determine the feasibility of implementing an intervention to reduce sitting time in adults undergoing cardiac rehabilitation.

Design: Pilot randomised controlled trial (1:1), with limited disclosure to participants.

Methods: Participants: Adults were recruited prior to a 6-week outpatient cardiac rehabilitation program.

Intervention: Cardiac rehabilitation plus a face-to-face session and workbook where participants were guided through individual and normative sitting time data and individualised goal setting. Participants incrementally integrated one goal weekly for five weeks. Control: Usual cardiac rehabilitation. Measures: 7-day sitting time, baseline and post-rehabilitation (activPAL3c). Intervention participants completed an evaluation form. Analysis: Intention to treat analyses were completed. Within and between group differences were explored with t-tests and ANOVA ( $\alpha=0.05$ ).

Results: Fifty participants were included in the analysis (65.0 $\pm$ 9.7 years, 86% male). Study retention was high (88% completed all assessments). Satisfaction with the intervention was high (mean of 8.4, where 10 represented 'extremely satisfied'), perceived burden was low (8.3, 10 was 'not time consuming at all'), and participants were likely to recommend the program (9.1, 10 was 'definitely'). Post-rehabilitation, there were non-significant decreases in sitting time (21.8min/d intervention, 3.5min/d control). Differences between groups were not significant.

Conclusion: An incremental goal setting intervention is feasible to be implemented with cardiac rehabilitation to reduce sitting time.

Key Practice Points:

- Implementation of a sitting time intervention is feasible with cardiac rehabilitation,
- Sitting time can be reduced in this population, however a larger trial is required,
- Possible health benefits of reducing sitting time in this population should be explored.

Proposed impact, if any, on the health outcomes of ATSI people: While no study participants identified as ATSI, findings may be highly relevant as cardiovascular disease is prevalent in this population. Interventions to reduce sitting time and explore possible health benefits in ATSI people with cardiovascular disease should be explored.

## COMPARING EXERCISE INTERVENTIONS FOR THE MANAGEMENT OF FATIGUE IN INDIVIDUALS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A SYSTEMATIC REVIEW

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**Aim:** To compare the effectiveness of exercise interventions on the management of fatigue in individuals with chronic obstructive pulmonary disease (COPD).

**Design:** Systematic review of randomised controlled trials

**Methods:** Five databases (MEDLINE, EMBASE, EMcare, PsychINFO and Cochrane library) were searched from inception to October 2018. Studies were included if individuals with COPD were randomised into two or more physical exercise interventions and subjectively measured fatigue. Meta-analyses were performed for studies that compared similar types of exercise interventions.

**Results:** Of the 395 full-text reviewed, 17 studies were included. Only two of the 17 studies included specifically aimed to assess the effects of the intervention on fatigue, others primarily aimed to assess the impact on physical condition or health-related quality of life. Studies compared endurance, resistance or a combination of both types of exercise. Meta-analysis found no significant difference between continuous and interval training on fatigue in people with COPD (pooled standard mean difference [SMD] = -0.17, 95%CI = -0.47 to 0.12, p = 0.25, n=3). There was also no significant difference between endurance and resistance training on fatigue (SMD = -0.35, 95%CI = -0.72 to 0.01, p = 0.07, n=3).

**Conclusion:** No specific intervention was more effective than others in the management of fatigue in individuals with COPD. Limited studies specifically aimed to assess effects of exercise interventions on fatigue.

**Key Practice Points:**

- Dependent on patient preference and compliance, clinicians may personalise exercise programs that include endurance, resistance or a combination of both exercises for effective fatigue management in individuals with COPD.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Findings of this study may be generalisable to Aboriginal and Torres Strait Islander people with COPD.

## CERVICAL MUSCULOSKELETAL IMPAIRMENTS IN MIGRAINE AND TENSION TYPE HEADACHE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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<sup>1</sup>The University Of Queensland, St Lucia, Australia

**Aim:** To study the evidence for cervical musculoskeletal impairments in migraine and tension type headache towards understanding the origin of neck pain in these headaches.

**Design:** Systematic review with meta-analysis of observational studies

Method: Search from inception to December 2018 of databases PubMed (Medline), EMBASE, CINAHL, SCOPUS, and Web of Science for studies on cervical impairments with comparator group. The Appraisal tool for Cross-Sectional Studies was used to assess risk of bias. Results were pooled using random effects meta-analysis. Level of evidence for each outcome was determined based on risk of bias, consistency of results and magnitude of difference between participants with headache and controls. (PROSPERO registration: CRD42018083683).

Results: Most studies included (n = 48) were rated moderate risk of bias due to possible confounding influences. Meta-analyses were performed on five of 17 outcomes. Tension type headache was associated with greater forward head posture (mean difference = -6.18°, 95% CI -8.18° to -4.18°) and less cervical range of motion (greatest mean difference = -15.0°, 95% CI -27.7° to -2.3°) than controls. Migraine was only associated with slightly reduced cervical range (greatest mean difference = -5.4°, 95% CI -9.9° to -0.9°). Strength, head posture, craniocervical flexion test, joint position error did not differ between migraineurs and controls.

Conclusions: Some impairments were detected in tension type headache but few in migraine. Levels of confidence in findings were low.

Key Practice Points:

- Low level evidence of cervical impairments in tension type headache
- More evidence supports normal cervical musculoskeletal function in migraine

## EXTENDING 11 RECOMMENDATIONS FOR MUSCULOSKELETAL PAIN CARE: OPPORTUNITIES AND CHALLENGES

Lin I<sup>1,2</sup>

<sup>1</sup>University of Western Australia, Geraldton, Australia, <sup>2</sup>Geraldton Regional Aboriginal Medical Service, Geraldton, Australia

Despite the burden of musculoskeletal (MSK) pain in Australia and the rest of the world, many current health care management practices are discordant with evidence. Arguably, if simple high value care options were offered to patients across the spectrum of care then the burden would be reduced.

In response, our collaboration looked to identify a simple framework for high value care that could be applied across MSK pain conditions. Following a synthesis of contemporary MSK pain clinical practice guidelines, we identified 11 common recommendations for MSK pain care (see: <https://bjsm.bmj.com/content/early/2019/03/02/bjsports-2018-099878>).

This presentation will firstly outline the framework and how it can be used to improve MSK pain care, then discuss some of the opportunities and challenges in implementing the recommendations in practice. Considerations include how the principles of patient-centre MSK care can be applied to promote equitable outcomes, and re-framing 'traditional' management recommendations, such as undertaking a physical examination, providing patient education, and manual therapy, in line with a contemporary multi-dimensional approach to MSK pain.

Key Practice Points:

Participants will gain an understanding of:

- A framework for high value musculoskeletal pain care which can be used to assess and improve the quality of care
- How the framework relates to a contemporary multi-dimensional approach to MSK pain, including identifying areas of emerging MSK pain practice



## PHYSIOTHERAPIST'S USE OF INTERACTIVE TECHNOLOGY FOR CLIENT CARE: A SCOPING REVIEW

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**Aim:** To examine the range of interactive technologies used by physiotherapists, and how these are incorporated in client care.

**Design:** A scoping review of papers describing physiotherapists' use of interactive technologies.

**Method:** The Joanna Briggs Institute methodology was used to search Medline, CINAHL, and Scopus databases (from 2000) using key terms covering physiotherapy and interactive technologies. Studies were included if they involved interactive technologies being used by physiotherapists for client care of people over the age of 18 years.

**Results:** 117 studies met the inclusion criteria. Randomised control trials (n=34, 29%), and non-randomised control trials (n=44, 38%) were the most common study types included in the review. Of these studies, virtual reality and exergaming were the most commonly described interactive technologies (n=51, 44%) followed closely by robotics (n=38, 33%). Clients recovering from stroke featured in the highest number of studies (n=51, 44%), ahead of musculoskeletal clients (n=12, 10%). Only 15 studies focused on the attitudes, opinions and experiences of clinicians using interactive technology in health care. Clinicians highlighted a range of challenges with using technology including lack of training for use of VR, lack of funding, poor setting, time constraints, and a lack of applicability to client's lifestyle.

**Conclusion:** Types of interactive technologies currently being implemented in a clinical setting vary depending on the population they are applied to. Studies demonstrate that interactive technology is being employed in an array of settings, with a high percentage of clinicians having a positive attitude towards interactive technology.

**Key Practice Points:**

- Training and education of physiotherapists on use of interactive technologies may increase use in client care
- More research on the barriers to implementing technology in physiotherapy practice is needed.
- Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander people: No specific impact.

## PEARLS AND PITFALLS. A PRIVATE PRACTICE JOURNEY TOWARDS NDIS REGISTRATION

Locke J<sup>1</sup>

<sup>1</sup>Rehab Health and Fitness Australia, Australia

Focussing on Private Practice this session will address our businesses experience to renew Registration under the National Quality and Safeguards Commission. Discussions will occur around our businesses approach to maintaining registration standards and addressing, then implementing the Core Modules across the service.

**Key points will address:**

- Pros and Cons of Registration and being a Registered practice and our business reasoning

- Practical implementation and learnings within a private practice business
- Information sources from the National Quality and Safeguards Commission
- Compliance costs
- Quality indicators implemented and procedures

## MENTAL HEALTH AND CHRONIC PAIN

Locke V<sup>1</sup>

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Mental health issues are more common among children and adolescents with persistent pain (Noel, 2016). The parents of children with persistent pain also experience elevated levels of anxiety and depression, as well as relationship stress (Benjamin, Harbeck-Weber & Sim, 2018). These psychological factors are likely to interact to produce greater distress and disability and serve as obstacles to treatment (Palermo and Chambers, 2005). This presentation will outline what research is telling us about the role of parental factors (e.g., the parent's own history of pain, parental solicitousness, and parental distress) in treatment outcomes, as well as emerging evidence that directly 'treating' parents adds to treatment efficacy (Palermo et al., 2016).

Key Practice Points:

- Anxiety and depression should be considered normative experiences in pain (primary or secondary), for both children and their parents, and planning treatment around this is crucial.
- The importance of clear formulations that include these factors in treatment planning.

## NON-INVASIVE POSITIVE AIRWAY PRESSURE THERAPY TO REDUCE POSTOPERATIVE LUNG COMPLICATIONS FOLLOWING UPPER ABDOMINAL SURGERY (NIPPER-PLUS): A PILOT RCT

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**Aim:** To determine: 1) whether there is a signal towards postoperative pulmonary complication (PPC) reduction with additional intermittent non-invasive ventilation (NIV) compared to continuous high-flow nasal cannula (HFNC) alone following elective upper abdominal surgery (UAS), and, 2) feasibility and safety of HFNC and physiotherapy-led NIV protocols.

**Design:** Single-centre, assessor-blinded, pilot RCT

**Methods:** 130 high-risk patients randomised to: (1) HFNC for 48 hours following extubation or, (2) HFNC plus five 30-minute NIV sessions delivered within first two days. All participants received standardised preoperative physiotherapy. Primary outcome: PPC incidence within 2 weeks. Secondary outcomes: 1) recruitment ability, 2) protocol adherence and 3) safety.

**Results:** PPC incidence was similar between groups (HFNC alone; 18% (n=12/65) vs. HFNC + NIV; 16% (n = 10/63), adjusted RR 1.16; 95% CI 0.54 to 2.52, p = 0.70). Consent rate was 96%. Delivery of continuous postoperative HFNC was achieved in 82% (n=105) of participants. Delivery of physiotherapy-led NIV within four hours post-extubation was achieved in 83% (n = 52), with 4.3 (SD 1.2) NIV sessions delivered; with one episode of hypotension requiring medical intervention. Delivery of NIV as per protocol was achieved in 54% of cohort.

Conclusion: A significant reduction in PPC was not detected. Delivery of continuous HFNC was feasible. Delivery of NIV within four hours post-extubation was achieved and safe with <1% adverse events.

Key Practice Points:

- Physiotherapy-led NIV following high-risk elective UAS was safe
- Future research is required to determine whether intermittent NIV is superior to continuous HFNC in this cohort

## HOW TO PROMOTE PHYSICAL ACTIVITY FOR OLDER ADULTS IN INSTITUTIONAL SETTINGS

Lynch E<sup>1</sup>

<sup>1</sup>University Of Adelaide, Adelaide, Australia

Background: People who are hospitalised, or living in interim or permanent residential aged care facilities, are often subjected to organisational safety cultures that promote sedentary behaviours. This may inadvertently lead to de-conditioning, loss of remaining functional independence and other negative sequelae. Physiotherapists working with older adults in institutional settings can be powerful change agents promoting safe physical activity that extends beyond therapy sessions, but implementing institutional change can be hard.

Aims/objectives: This ‘how to’ session will draw on literature, current research and clinical experiences to arm participants’ with practical knowledge and skills to promote physical activity among older adults in institutional settings in a safe and sustainable way.

Approach: Literature regarding change management in healthcare settings will be summarised and presented. Current research and case studies of successful and not-so-successful initiatives that have been introduced to promote physical activity in older adults will be presented. Two experienced physiotherapists and implementers will discuss approaches they have used to promote physical activity (including group work, use of technology, self-management strategies), and share what they have learned (often the hard way). The session will conclude with a chaired panel discussion to allow for interactive discussion between presenters and participants.

Key Practice Points:

- Participants will learn how to plan and implement sustainable organisational initiatives that promote physical activity among older adults in institutional settings.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Suggested strategies can be used with people from all cultural backgrounds.

## THE CHALLENGES AND OPPORTUNITIES FOR PHYSIOTHERAPISTS TO IMPLEMENT EVIDENCE IN STROKE REHABILITATION SETTINGS

Lynch E<sup>1</sup>

<sup>1</sup>Adelaide Nursing School, University of Adelaide, , Australia

Background: The evidence base for interventions to reduce disability and improve function after stroke is growing exponentially. Evidence about interventions for people with stroke has been synthesised into Stroke Clinical Guidelines to help health professionals improve the quality of care they provide. However, in 2018, only 66% of inpatient stroke rehabilitation facilities in Australia reported adhering to the Guidelines. This means that many people with stroke are not receiving interventions that have been proven to reduce disability and optimise function.

Physiotherapists have a central role in stroke rehabilitation settings and therefore are ideally placed to lead and support the implementation of evidence-based rehabilitation interventions. Physiotherapists face unique challenges and opportunities when seeking to implement evidence in stroke rehabilitation practice.

**Objectives:** To highlight factors pertaining to the unique context of both the physiotherapy profession and rehabilitation environments that can influence implementation of evidence in stroke rehabilitation. To enhance physiotherapists' knowledge and confidence to implement evidence-based stroke rehabilitation.

**Methods:** A pragmatic guide to implementation will be presented, with a particular focus on implementation of evidence-based rehabilitation interventions by physiotherapists. Illustrative case studies will be discussed to demonstrate how physiotherapists can successfully implement evidence-based rehabilitation, through careful planning and consideration of key factors relating to the context of stroke rehabilitation and physiotherapy.

#### Key Practice Points

- Participants will learn pragmatic tips and strategies to implement evidence-based rehabilitation in stroke rehabilitation settings

## YEAR 1 CHILDREN ARE SEDENTARY DURING SCHOOL CLASS TIME AND CAN MOVE MORE

**Macdonald K<sup>1</sup>**, Milne N<sup>1</sup>, Pope R<sup>1,2</sup>, Orr R<sup>1</sup>

<sup>1</sup>Bond University, Robina, Australia, <sup>2</sup>Charles Sturt University, Albury, Australia

**Aim:** To directly observe Year 1 children's physical activity during school class time and identify opportunities for incorporation of additional activity.

**Design:** Cross-sectional study.

**Method:** Thirty-four Year 1 children (boys: n=20, girls: n=14; mean age: 6.36±0.34 years) from one primary school in Queensland, Australia participated. A modified version of the Observational System for Recording Physical Activity in Children-Elementary was used to record the intensity of children's physical activity, and the physical, instructional, and social context of activity. The number of intervals and percentages of total intervals observed in the different intensity levels by specific contexts were calculated.

**Results:** Year 1 children were sedentary for the majority (86%) of observed intervals during class time. A total of 12% and 2% of intervals were spent in light and moderate-to-vigorous activity respectively. Classroom-based physical activity (2.8%) and incidental activity (6.7%) were observed infrequently and could be encouraged more often.

**Conclusion:** Year 1 children were observed engaging in predominantly sedentary academic activities during class time. Incorporating movement into academic lessons or during transitions may encourage children to be more active. Children's incidental activity may also be promoted during class group activities. Supporting schools to identify and implement opportunities for children to be active during class time may also optimise both the health and learning outcomes of children.

#### Key Practice Point:

- Physiotherapists have a valuable role in children's physical activity promotion and can collaborate with schools to identify opportunities for children in the early years of school to be more active during the school day.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this study, when applied in schools, are likely to benefit both Aboriginal and Torres Strait Islander children and non-Indigenous children.

## FACILITATORS AND BARRIERS FOR PROVIDING CLASSROOM-BASED PHYSICAL ACTIVITY TO STUDENTS IN THE EARLY YEARS OF PRIMARY SCHOOL: A PILOT SURVEY

**Macdonald K<sup>1</sup>**, Milne N<sup>1</sup>, Pope R<sup>1,2</sup>, Orr R<sup>1</sup>

<sup>1</sup>Bond University, Robina, Australia, <sup>2</sup>Charles Sturt University, Albury, Australia

**Aim:** To explore the perceived facilitators and barriers for providing classroom-based physical activity to students in the early years of primary school

**Design:** Cross-sectional online survey

**Methods:** A 45-item online survey was conducted with classroom teachers and school principals currently working with students in Prep/Kindergarten to Year 2 in Australia. A socio-ecological approach was used to investigate the multiple factors that may influence the ability of teachers to provide physical activity opportunities to students in the classroom. Content analysis was used to identify common themes in open-ended responses.

**Results:** Thirty of 60 primary school staff completed the survey. Main barriers for providing classroom-based physical activity included: organisation-level factors (e.g. time pressures due to an overcrowded curriculum), limited professional development opportunities, and limited resources on classroom-based physical activity. Proposed facilitators included: creating a supportive school climate towards physical activity, including the implementation of school physical activity policies, and staff professional development opportunities regarding effective strategies to implement classroom-based physical activity.

**Conclusion:** Insufficient time, limited professional development opportunities and access to resources are the main barriers to providing classroom-based physical activity to students. However, the primary facilitator includes having school administration support for children's physical activity promotion at an organisational level.

**Key Practice Point:**

- An emerging public health role for physiotherapists may be to advise and support schools to implement comprehensive school physical activity programs, as part of a health promoting schools approach.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this study, when applied in schools, are likely to benefit both Aboriginal and Torres Strait Islander children and non-Indigenous children.

## DIGNITY OF RISK FOR PEOPLE LIVING WITH ACQUIRED BRAIN INJURY

**Mackintosh S<sup>1</sup>**, Van Kessel G<sup>1</sup>, Murray C<sup>1</sup>, Forsythe D<sup>1</sup>, Stanley M<sup>1,2</sup>

<sup>1</sup>University of South Australia, Adelaide, Australia, <sup>2</sup>Edith Cowen University, Perth, Australia

**Aim:** to explore how occupational therapists and physiotherapists manage risk for people living with brain injury.

**Design:** Grounded theory, qualitative

Method: Semi-structured, in-depth interviews with 17 occupational therapists and physiotherapists working with people following brain injury. Interview transcripts were analysed through line by line open coding, with emerging categories developed through research team discussions.

Results: The core category, the weighing up process, was a process therapists undertook to 'weigh up' a client's capacity to make a decision, the likelihood and potential consequences of a positive or negative outcome, their appetite for risk, and the importance of the decision. More experienced therapists were more comfortable with privileging the client's perspective to enable the dignity of risk and appreciated the need for clients to learn from taking risks.

Conclusion: Respecting dignity is placed at risk when therapists only focus on do no harm.

Key Practice Points:

- When therapists shift their focus from minimising risk to managing risk as a process, they privilege client's knowledge, experiences and wishes.
- Give greater weight to supporting client learning either through success or failure.
- Respecting dignity shines a light on the need to respect autonomy and promote justice for people with ABI.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Privileging the knowledge, experiences and wishes of Aboriginal and Torres Strait Islander people is particularly important in the context of their higher incidence rate of acquired brain injury.

## 'BEST PRACTICE MANAGEMENT OF ROTATOR CUFF RELATED SHOULDER PAIN' – CONSIDERATIONS AND RECOMMENDATIONS

Magarey M<sup>1</sup>

<sup>1</sup>*Flex Rehab Clinic, Norwood, Australia*

Background: At the 2017 APA National Conference, Keynote Speaker Jeremy Lewis argued that most forms of surgical management for rotator cuff related shoulder pain (RCRSP) resulted in outcomes that were no better than placebo. He also argued, in part, that outcomes following RCSRSP physiotherapy management are 'at least as good as surgery'. As a Specialist Musculoskeletal Physiotherapist, I believe that in many cases of RCRSP 'best practice physiotherapy' can lead to better outcomes than surgery, provided management considers all factors that may influence shoulder complex function.

Aim: To offer recommendations on best practice non-surgical RCRSP assessment and management. This presentation will explore the breadth of considerations required to provide best practice RCRSP assessment and management. Those considerations include relevant anatomy (contributions of the rotator cuff itself, the bursae around the shoulder, scapular muscle function, the cervico-thoracic spine and kinetic chain), neurophysiology, biomechanics, contemporary tendon research, pain science, and the influence of the metabolic and immune systems. By thinking beyond the shoulder itself, the information provided will enable physiotherapists to transform their assessment and management of RCRSP.

Key Practice Points;

- Understanding the anatomy, biomechanics and physiology of the shoulder, rotator cuff and related regions may enhance interpretation of assessment findings and RCRSP management.
- RCRSP assessment and management should include a range of domains beyond the shoulder itself including the cervical and thoracic spine, scapular mobility and muscle function, rotator cuff muscle function, the contribution of the glenohumeral joint and the whole kinetic chain.

## PREDICTING PHYSICAL ACTIVITY INTENSITY USING WALKING CADENCE IN PEOPLE WITH STROKE

**Mahendran N<sup>1</sup>**, Kuys S<sup>2</sup>, Brauer S<sup>3</sup>

<sup>1</sup>*Discipline of Physiotherapy, Faculty of Health, University Of Canberra, Canberra, Australia,* <sup>2</sup>*School of Allied Health, Faculty of Health Sciences, Australian Catholic University, Brisbane, Australia,* <sup>3</sup>*Physiotherapy, School of Health and Rehabilitation Sciences, University of Queensland, Brisbane, Australia*

**Aim:** Walking cadence is related to activity intensity and could be used clinically to prescribe physical activity intensity. This study aimed to determine the walking cadence required to achieve moderate and vigorous intensity physical activity after stroke.

**Design:** Cross-sectional observational study.

**Method:** Eleven independently ambulant people with chronic, unilateral stroke (mean age: 57±11 years, 90% male) completed eight, two-minute overground walk tests, including self-selected pace, and at 20, 40, 60, 80, 100, 120 and 140 steps/minute (paced by a metronome). Activity intensity (METs) was measured during each walk test using a portable metabolic cart (MetaMax 3B), and categorised as: low (<3 METs), moderate (3-6 METs) and vigorous (>6 METs). Logistic regression was used to predict activity intensity from cadence.

**Results:** Participants were mild to moderately disabled (median modified Rankin Scale score: 2, IQR 1). Mean comfortable walking speed was 1.05±0.2m/s. The regression model significantly predicted activity intensity from cadence ( $p = 0.001$ , goodness of fit: Chi-square 53.9) and accounted for 80% of the variance: Activity intensity (METs) =  $(0.126 \times \text{cadence}) - 13.42$ .

A minimum of 130 steps per minute was required to achieve moderate intensity walking activity. No participant achieved vigorous intensity activity during walk tests used in this study. A cadence greater than 154 steps per minute was predicted to achieve vigorous intensity activity.

**Conclusion/Key Practice Points:**

- Walking cadence could be considered by physiotherapists as one approach to prescribe moderate intensity physical activity (130 to 153 steps/minute) for people with mild to moderate stroke.

Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander people: While not tested in this population, the cadence definitions identified in this study could be used to prescribe moderate and vigorous intensity physical activity for Aboriginal and Torres Strait Islander people living with mild to moderate stroke.

## RESEARCH STORIES: LOOKING BEYOND WHAT IS WRITTEN IN THE SCIENTIFIC PAPER

**Maher C<sup>1</sup>**

<sup>1</sup>*Institute for Musculoskeletal Health, University of Sydney, Sydney, Australia*

The JOP Oration will summarise some of Chris Maher's research that has had the greatest impact globally. It will focus on the research evaluating pain medicines and his work contributing to the Lancet Low Back Pain Series. For example, one trial that will be discussed in detail will be the PACE Trial, which found that paracetamol was no more effective than a placebo for back pain. PACE elicited great controversy at the time as paracetamol was uniformly endorsed as the first line treatment for back pain. Subsequently guidelines around the world have changed, and use of paracetamol is discouraged. Among the other research to be



discussed will be the PRECISE trial evaluating the use of pregabalin for sciatica and research evaluating the use of opioids for spinal pain. In addition to the methods and results of these studies, the presentation will share the back stories to each study, the challenges in completing the research and the positive and negative reactions the work elicited. The presentation will also give an understanding of how the work has created, or contributed to, change in policy and practice. The presentation is therefore intended both to summarise the research and to inspire others to see that research can be a rewarding and worthwhile career pathway.

## FEEDBACK PROVIDED TO PHYSIOTHERAPY STUDENTS BY STANDARDISED PATIENTS: KEY STAKEHOLDER PERSPECTIVES

**Mandrusiak A<sup>1</sup>**, Forbes R<sup>1</sup>, Williams K<sup>1</sup>

<sup>1</sup>*The University Of Queensland, Brisbane, Australia*

**Aim:** To evaluate views of physiotherapy students, standardised patients and clinical educators regarding scope and delivery of feedback provided to students by standardised patients.

**Design:** Quantitative and qualitative self-report measure.

**Method:** 169 final year students (undergraduate and graduate entry masters), 32 standardised patients and 22 clinical educators were surveyed at completion of a simulation program that included cardiorespiratory, musculoskeletal and neurological streams. Descriptive analyses of ratings of agreement and perceived importance were performed, as well as non-parametric analyses of differences between stakeholder groups. Open responses were analysed thematically.

**Results:** Almost all respondents (96.7%) agreed or strongly agreed that standardised patients should provide feedback on non-technical skills. Nearly all students (90.5%) also rated agreement for technical skills, whereas agreement for this item was significantly lower amongst standardised patients (53.1%,  $p < 0.001$ ). Most standardised patients (75%) agreed or strongly agreed that feedback should be mostly positive, whereas only 36.1% of students felt this way ( $p < 0.001$ ); 47.9% of students thought feedback should focus on limitations compared with 12.5% of standardised patients ( $p < 0.001$ ). Most respondents agreed that feedback should be delivered verbally (77.6%), immediately after each student's turn (72%) with all students in the group present (76.2%). Emerging themes from all stakeholder groups included ensuring sufficient time for, and consistency of, feedback.

**Conclusion:** There was agreement on the importance of many domains of feedback in simulation, yet some mismatch between opinions related to technical skills and balance of positive and negative feedback.

**Key Practice Points:**

- Feedback from standardised patients is a valued part of simulation.
- Expectations around feedback should be clarified amongst stakeholders.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research is in education and is not specific to health outcomes of Aboriginal and Torres Strait Islander people.

## THE USE OF AQUATIC TREADMILLS IN EQUINE ATHLETES

Mathlin E

Water treadmills are being more commonly used as both rehabilitation tools after joint, tendon and ligament injuries and for conditioning in horses. Research into the biomechanical and physiological effect of various water heights has shown alterations in distal limb joint range of motion, stride variables, spinal range of motion and exercise intensity. Currently there is limited evidence for the application of water treadmill use in specific equine conditions. Safety of horse and handler, habituation to the treadmill, potential for adverse effects and individual responses to water height should be considered when designing water treadmill programs for horses.

Key Practice Points:

- Known benefits and potential risks of water treadmill use in horses and possible applications for conditioning and rehabilitation.

## PREDICTING LOAD CARRIAGE INJURY RISK IN RECREATIONAL HIKERS

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<sup>1</sup>Tactical Research Unit, Bond University, Robina, Australia, <sup>2</sup>Physiotherapy Program, Bond University, Gold Coast, Australia

Aim: To investigate if an equation can be used to predict load carriage injury risk in recreational hikers and hiking guides

Design: A prospective cohort study

Method: Participants (n = 31; age = 41.8±15.4 years, mass = 67.7±12.8kg) for this study were recruited through purposive sampling from a recreational hiking company. Surveys, prior to and after a multiple day hike, were administered investigating current fitness levels, loads carried, body weight and injuries. Individual hike performance data were entered into a modified load carriage energy cost equation to determine the %VO<sub>2</sub>max work effort ( $M = 1.5 W + 2.0 (W + L)(L/W)^2 + \eta(W + L)[1.5 V_2 + 0.35 VG] + V_2(0.015LH_2 + 0.064LF_2)$ ) and the survey data applied to inform a risk management framework level of injury risk matrix (very low, low, medium, high or very high risk). Predictions were then compared to actual results.

Results: Mean predicted work effort was 40.9 (±6.5) %VO<sub>2</sub>max). Seven participants were classified as 'low risk' and the remaining 24 as 'medium risk'. None of the participants deemed to be 'low risk' suffered an injury, while five of the 24 (20.8%) of the 'medium risk' group suffered an injury.

Conclusion: A modified load carriage equation, could successfully predict successful completion of a recreation hike but with limited sensitivity.

Key Practice Points:

- This load carriage equation could be used in recreational hiking populations, as well as other occupations which require load carriage, to screen for injury risk prior to a load carriage event or as part of return-to-work rehabilitation.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population above that of the non-Indigenous population

## FITNESS PROFILES IN ELITE TACTICAL UNITS: A CRITICAL REVIEW

**Maupin D<sup>1</sup>**, Orr R<sup>1,2</sup>, Schram B<sup>1,2</sup>, Wills T<sup>1</sup>

<sup>1</sup>Bond University Faculty of Health and Human Sciences, Robina, Australia, <sup>2</sup>Bond University Tactical Research Unit, Robina, Australia

**Aim:** Elite tactical units complete a variety of demanding tasks and a high level of fitness is required to perform their occupational tasks optimally. These personnel comprise a unique population (elite specialists) within an already unique occupation (tactical personnel) and as such fitness profiles that may guide reconditioning practices and return-to-work approaches are limited.

**Design:** A systematic review of studies that have investigated the fitness profiles of elite tactical units from 1987 to 2017.

**Methods:** Following the PRIMA guidelines, Pubmed, CiNAHL, and Embase databases were searched and dedicated inclusion and exclusion criteria applied. Included studies were critically appraised, using the Downs and Black checklist and graded via the Kennelly grading system. The level of agreement between raters was calculated using a kappa analysis.

**Results:** Fourteen studies were included for review (mean = 57.5%±5.77; range 46% - 66%) with a moderate interrater agreement ( $\kappa = 0.496$ ). The most common measures with this population included anthropometric measures, strength, power, and aerobic capacity. However, there was high variety in the measures and their protocols.

**Conclusion:** Elite tactical units were found to have a greater aerobic capacity, muscular endurance, and agility but similar sprint speed, power, and muscular strength when compared to the general population and general military and police personnel.

### Key Practice Points:

- General population norms may not be a valid measure for reconditioning elite tactical personnel.
- Elite tactical units possess fitness levels on average higher than those in general police and military and as such may require a longer return-to-work reconditioning period.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## PREPARE FOR CHANGE: A STATEWIDE ALLIED HEALTH WORKFORCE SURVEY

**McBride L<sup>1</sup>**, Gavaghan B<sup>1</sup>, Nissen L<sup>2</sup>, Yates P<sup>2</sup>, Rosenthal M<sup>2</sup>, Buttrum P<sup>3</sup>, Stute M<sup>4</sup>, Coccetti A<sup>5</sup>, Hulcombe J<sup>2</sup>

<sup>1</sup>Clinical Excellence Queensland, Herston, Australia, <sup>2</sup>Queensland University of Technology, Brisbane, Australia, <sup>3</sup>Royal Brisbane and Women's Hospital, Brisbane, Australia, <sup>4</sup>Metro North Hospital and Health Service, Brisbane, Australia, <sup>5</sup>Logan & Beaudersert Hospitals, Brisbane, Australia

**Aim:** The role of physiotherapists continues to change and diversify to align with contemporary and high value health care models. The aim of this study is to investigate patterns of practice activity within and across the allied health professions.

**Design:** Cross-sectional electronic survey of Queensland public sector allied health professionals.

**Method:** The survey was undertaken using a modified version of the Advanced Practice Role Delineation tool based on the Strong Model of Advanced Practice. Survey questions explored domains of practice, including clinical care, management, education, research and leadership.

**Results:** In total, 2,542 allied health professionals participated in the survey (response rate of 27%). Of these, 349 participants identified their profession to be physiotherapy (response rate of 26%). The physiotherapists in this study consistently reported high participation in clinical care activities. Participation in clinical education was also high, with physiotherapists at a junior level indicating greater levels of participation when compared to the other allied health professions. However, participation in research and leadership activities varied considerably, with higher levels of participation reported by more experienced physiotherapists and those in team leader and manager positions.

**Conclusion:** Findings from this study will be used to develop targeted strategies to build workforce capacity and capability and enhance the contribution of physiotherapists to research and leadership activities.

**Key Practice Points:**

- It is anticipated that targeted workforce strategies will lead to improved participation in research and leadership activities for physiotherapists at all levels, leading to a greater translation of research into practice.

## SELF-REPORTED PHYSICAL ACTIVITY AND THE IMPACT OF EXERCISE ON SYMPTOMS IN PEOPLE LIVING WITH DYSTONIA

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<sup>1</sup>University Of Auckland, Auckland, New Zealand, <sup>2</sup>University of Technology Sydney, Sydney, Australia

**Background:** Dystonia is a neurological movement disorder presenting as sustained or intermittent involuntary muscle contractions causing abnormal postures and movements. Physical activity is a key element of neurological disease management, with wide-ranging benefits for health and quality of life. Few studies have explored physical activity in dystonia. Understanding factors that promote or prevent engagement in physical activity could reveal how to address physical inactivity in this population.

**Methods:** Participants diagnosed with dystonia completed a mixed methods anonymous online survey regarding activity behaviours. Self-reported physical activity was measured using the International Physical Activity Questionnaire and sedentary behaviour measured using the Adult Sedentary Behaviour Survey. Social-ecological barriers to exercise and the impact of exercise on dystonic symptoms were also explored.

**Results:** 265 participants completed the study (mean age 56yrs, 76% Female). The most common dystonia type was cervical dystonia. Just over 50% of respondents were currently under treatment with botulinum toxin injections and a similar number were taking psychoactive medication. More than half the respondents were dissatisfied with their current level of physical activity. Two-thirds indicated dystonia had decreased their physical activity each week because of dystonia symptoms; most cited were fatigue, motor symptoms, poor balance and pain. More than 60% of respondents found dystonic symptoms were worsened in the longer-term i.e. days or weeks after exercising. Brisk walking, jogging and running were the most aggravating activities. Common barriers to exercise were; physical impairments, negative emotions, lack of funding, cost of programs, and lack of trained professionals with knowledge of dystonia.

**Conclusion:** The findings highlight the demand for appropriate strategies to enable people with dystonia to be more physically active. Future studies should incorporate more robust methods of physical activity and sedentary behaviour measurement (e.g. accelerometry) and explore the causal mechanisms related to why exercise and physical activity aggravates dystonic symptoms.

## LAUNCH OF THE NEW ONLINE NATIONAL SAFETY MODULE

McCutcheon L

In conjunction with the third revision of the ASAP Guidelines for Safe Acupuncture and Dry Needling (2018) and in consideration to the newly revised Australian Guidelines for the Prevention and Control of Infection in Health Care (2019) and reviewed needle insertion guidelines from the National Health and Medical Research Council's Australian Immunisation Guidelines (2015) the ADNG has created a six part interactive online safety module. Pertinent changes in safety standards for the practice of acupuncture and dry needling will be outlined in this presentation. Relevant considerations of legal obligations and professional indemnity insurance will also be addressed in this session. This presentation is pertinent for physiotherapists utilising needling as a clinical modality or for physiotherapists or organisations employing physiotherapists that practice Acupuncture or Dry Needling.

## INTERNATIONAL NEEDLING TRENDS - SHOULD WE FOLLOW?

McCutcheon L

The popularity and use of Dry Needling has escalated in main stream medicine over the past decade. It is estimated that 15,000 physiotherapists are now integrating various forms of Dry Needling and Western Acupuncture into their standard clinical practice of various musculoskeletal conditions. Dry needling techniques utilized by Australian physiotherapists are influenced by both local and international needling trends. Needling into vulnerable areas in the cervical region, around the pelvic region and into the deep posterior compartment are addressed and various alternative techniques are presented and discussed.

## PRACTICAL STRATEGIES FOR THE CLINICIAN IN THE APPLICATION OF AN EVIDENCE-BASED PRACTICE APPROACH

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<sup>1</sup>University of South Australia, Adelaide, Australia

Background: Physiotherapy values and encourages an evidence-based practice (EBP) approach to learning, professional development and client care. However, the practical application of EBP is often reduced overly-simplistically to best research evidence, at the expense of the contribution from clinical experience and expertise, client preferences and circumstances, and the context of the clinical environment. Research has identified different time points of perceived relevance of EBP, and consideration of how to apply it. Developing a more comprehensive understanding of the nuances underpinning EBP may lead to a more consistent and practical reflection on its value by clinicians.

Aims/ objectives: To better understand what successful use of EBP involves and how EBP may be re-focussed in the transition from student to physiotherapy graduate to practicing clinician.

Approach: In a brief workshop-style session, clinical examples, practical tips and strategies for developing and applying EBP in different professional environments will be presented. Handouts with key learning points and practical strategies will be provided.

Key Practice Points:

Participants will consider:

- Re-engaging with the EBP and recognising the importance of clinical experience and expertise
- Examples of the successful application of EBP in the musculoskeletal setting
- Ways to motivate early career clinicians to better apply meaningful EBP

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: Evidence-based practice is client-centred and applied within the context of the clinical decision-making. The participants will have the skills to more fully apply EBP relevant to Aboriginal health, appropriate to their professional roles and responsibilities.

## BREAST SUPPORT AFTER BREAST CANCER SURGERY: THE ROLE OF PHYSIOTHERAPY

McGhee D<sup>1</sup>

<sup>1</sup>University of Wollongong, Wollongong, Australia

Background: Bra discomfort and difficulty finding a comfortable bra are common issues experienced by women after breast cancer surgery. Bra discomfort negatively impacts quality of life because it is endured for such long durations and difficulty finding a comfortable bra to exercise in negatively impacts health because it has been ranked the third highest barrier to physical activity by women after breast cancer surgery. Many of these bra-related issues however can be alleviated or resolved, and physiotherapists are the ideal profession to lead the education and management of these issues, using a problem-solving approach and their understanding of anatomy and biomechanics.

Aims / objectives: This session provides strategies to address common breast support and bra fit issues related to the side-effects of breast cancer surgery and treatment.

Learning outcomes include: (i) applied knowledge and understanding of the side effects of breast cancer surgery and how they impact breast support and bra fit - assessing the patient, her skin/scars/musculoskeletal issues, breast support needs, bra fit and discomfort, and (ii) skill and competency in breast support - critiquing bra design to guiding women on the breast support strategies to address their specific needs and issues.

Conclusion / Key Practice Points:

- Understanding of the skin and musculoskeletal side-effects of breast cancer surgery/treatment that affect breast support and bra fit
- Assessment of the breast support and bra fit needs and issues of women after breast cancer surgery/treatment
- Strategies to address common breast support and bra fit issues experienced by women after breast cancer surgery/treatment

## SERRATUS ANTERIOR ACTIVATION IS NOT INCREASED BY THE ADDITION OF REAL-TIME ULTRASOUND FEEDBACK IN SYMPTOMATIC ADULTS: A RANDOMISED CROSS-OVER TRIAL

McKenna L<sup>1</sup>, Bonnett L<sup>1</sup>, Panzich K<sup>1</sup>, Hansen S<sup>1</sup>, Lim J<sup>1</sup>, Graves A<sup>1,2</sup>, Williams S<sup>1,3</sup>

<sup>1</sup>Curtin University, Bentley, Australia, <sup>2</sup>SKG Radiology, Perth, Australia, <sup>3</sup>Department of Surgery and Auckland Bioengineering Institute, University of Auckland, Auckland, New Zealand

Aim: Does addition of real-time ultrasound visual feedback increase activation of serratus anterior in adults with painful shoulders in comparison to manual facilitation alone?

Design: Randomised cross-over trial with blinded assessment.

Method: Participants with mild-moderate unilateral subacromial pain completed two interventions targeting serratus anterior activation, with at least one week washout between. Interventions were either 15 repetitions of a supine 'serratus punch' facilitated by manual facilitation alone or manual facilitation with

the addition of real-time ultrasound imaging feedback. Surface electromyography (normalised to maximum voluntary isometric contraction) recorded levels of serratus anterior activation before, during, and after intervention.

Results: Twenty six participants completed manual facilitation only and 25 completed real-time ultrasound with manual facilitation. During intervention, median (25th, 75th quartile) serratus anterior activation was 96.7% (65.6, 159.6%) for manual facilitation alone and 93.2% (61.0, 171.4%) for manual facilitation with the addition of real-time ultrasound imaging. Median difference before and after manual facilitation alone was 2.3% (-31.7, 17.1%). Median difference before and after real-time ultrasound feedback with manual facilitation was 0.2% (-23.6, 27.0%). Median (95% CI) between group difference in change from before to after intervention was 16.4% (-5.7% to 25.1%).

Conclusion: Immediate serratus anterior activation in adults with symptomatic shoulders is not increased by the addition of real-time ultrasound visual feedback compared with manual facilitation alone.

#### Key Practice Points

- Practitioners may not need to include real-time ultrasound visual feedback to improve serratus anterior activation for patients with mild shoulder symptoms, when only 15 contractions are used.

Trial Registration: ANZCTR371352

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Although this research is not specific to Aboriginal and Torres Strait Islander people, it is plausible that this research will have a similar impact on practitioner treatment choices for both Aboriginal and Torres Strait Islander and non-Indigenous populations.

## SELF-REPORTED SEDENTARY TIME IN COPD AND BRONCHIECTASIS

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Aim: To compare self-reported sedentary time for nine sedentary behaviours in people with COPD and bronchiectasis.

Design: Prospective, observational study

Method: Participants included people with COPD or bronchiectasis from two pulmonary rehabilitation programs in Sydney. Participants completed the Sedentary Behaviour Questionnaire (SBQ) which determined sedentary time (hours/day) during waking hours on a typical weekday and weekend day of nine common sedentary behaviours. These scores were summated to determine a total average sedentary time (hours/day). The total sedentary time and the time for each of the nine behaviours was compared between the people with COPD and bronchiectasis using an unpaired t-test.

Results: The sample consisted of 103 people with COPD (52% male; mean age (SD) = 73 (9) years, FEV1 = 56 (23) % predicted) and 33 people with bronchiectasis (52% male; mean age (SD) = 74 (8) years, FEV1 = 69 (25) % predicted). Average total sedentary time was 7.6 (2.7) hours/day in COPD and 8.0 (4.1) hours/day in bronchiectasis, with no between group difference (-0.4, 95% CI -1.7, 0.8). The time spent watching television was the most common behaviour in COPD (3.2 (1.5) hours/day) and bronchiectasis (3.0 (1.7) hours/day) with no between group difference (0.3, 95% CI -0.4, 0.9).



Conclusion: There was no difference in self-reported total sedentary time between people with COPD and bronchiectasis based on the SBQ.

Key Practice Points:

- Measurement of sedentary behaviour is important for people with chronic respiratory disease.
- Since the most common sedentary behaviour was the time spent watching television, this could be targeted in behaviour change interventions to reduce sedentary behaviour.

## CHANGES IN PHYSICAL ACTIVITY AFTER EXERCISE TRAINING WITH AIR OR OXYGEN IN PEOPLE WITH COPD WHO EXPERIENCE EXERCISE-INDUCED DESATURATION

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Aim: To evaluate changes in physical activity (PA) following exercise training on air or oxygen in people with COPD who experience exercise-induced oxygen desaturation (EID).

Design: Secondary analysis of a RCT

Method: COPD participants who desaturated to SpO<sub>2</sub> < 90% during a six-minute walk test were randomised to receive oxygen (OG) or air (AG) during thrice weekly exercise training over eight weeks. Outcomes, measured before and after the program, were PA using an activity monitor (SenseWear MF), and peak and endurance exercise capacity using the incremental and endurance shuttle walk tests (ISWT & ESWT), respectively. PA responders increased their PA by ≥600 steps/day following training. Changes in ISWT distance and ESWT time were compared between PA responders and non-responders using an unpaired t-test.

Results: 87 participants [48 males; mean (SD) age 70 (8) years; FEV<sub>1</sub> 48 (18)% predicted] completed training (OG n=48; AG n=39). The group were “inactive” at baseline [3,135 (2,215) steps/day] with no significant improvement in PA after training in the whole group [mean difference (95% CI)]: -102 (-351 to 146) steps/day, OG: 47 (-281 to 376) steps/day, or AG: -287 (-674 to 100) steps/day. Twenty participants (18%) were PA responders (OG n=12; AG n=8) with a mean 1,307 (753) improvement in steps/day compared to a 523 (909) decline in steps/day in non-responders (p<0.001). There was no difference in the improvement in ISWT distance or ESWT time after training between responders and non-responders (ISWT: 35 (40) m vs 29 (49) m, p=0.6; ESWT: 176 (432) s vs 171 (280) s, p=1.0).

Conclusion: Most people with COPD and EID did not demonstrate an increase in PA following individually prescribed and progressed exercise training on air or oxygen.

Key Practice Points:

- Strategies other than exercise training need to be considered to improve PA levels in people with COPD and EID.

## IMPROVING PULMONARY REHABILITATION COMPLETION WITH EXERCISE AND EDUCATION MODULES: THE PuReMod TRIAL

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**Aim:** To determine the effect of a Pulmonary Rehabilitation Modular (PuReMod) program on pulmonary rehabilitation (PR) completion, health outcomes, and knowledge in people with chronic respiratory disease (CRD).

**Design:** Prospective cohort with historical comparison group.

**Method:** People with CRD referred to PR attended a face-to-face assessment. Based on eligibility criteria and health/safety screening, participants were offered a choice of one of three supervised group exercise training modules: hospital land (gym)-based, hospital water(pool)-based, or home telerehabilitation. Exercise sessions were twice-weekly for eight weeks. Based on medical/screening history and lung disease knowledge, participants were allocated to one or more individual or group education modules. Outcomes were compared to an historical traditional PR group.

**Results:** Of 152 participants (41% male; 74 (10) years) recruited to date, 138 (91%) were eligible for more than one exercise training module. Participant choice of land-based, water-based, and telerehabilitation exercise modules was 72%, 16%, and 12%, respectively. Modular education reduced average PR education time by 5.5 hours ( $p < 0.001$ ). Completion rate for PuReMod was 67% compared with 54% for traditional PR ( $p < 0.001$ ). Improvement in health outcomes and lung disease knowledge for PuReMod were similar to traditional PR.

**Conclusion:** Compared to traditional PR, PuReMod improved PR completion and reduced PR education hours, with similar improvement in health outcomes and lung disease knowledge.

**Key Practice Point:**

- A modular PR program offering choice of exercise training environment and tailored education modules is beneficial in increasing PR completion rates and improving health outcomes and lung disease knowledge.

**Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander people:** A new model of PR providing choice of exercise training environment and individualised education modules may improve the uptake and completion rates of PR and subsequent health outcomes of Aboriginal and Torres Strait Islander people with chronic respiratory disease.

## GETTING HOME AND STAYING HOME: CONSIDERING OPPORTUNITIES FOR HOSPITALISED FRAIL OLDER ADULTS TO RETURN HOME SOONER WHILE AVOIDING RE-HOSPITALISATION AND NEW RESIDENTIAL CARE ADMISSIONS

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For older adults, admissions to hospital may allow them to receive life preserving or quality of life improving interventions. On the other hand, hospitalisations can also contribute to a cascade of events culminating in loss of functional independence, readmissions to hospital and death. Physiotherapists have opportunities to play key roles in contributing positive patient outcomes, while reducing risk of negative outcomes. This

presentation will draw on findings from an ongoing series of longitudinal studies among older adults that has included more than 30 000 acute hospital admissions from 140 hospitals, and 4000 subacute geriatric rehabilitation admissions. The presentation will include findings from multi-level modelling of linked health system and health service data as well as clinical assessment data to identify and discuss practical opportunities arising for physiotherapists to help reduce undesirable outcomes among frail adults who have been hospitalised, often with multiple comorbidities (multimorbidity), and promote functional independence. The presentation will integrate and interpret findings from this program of research with other local and international studies to consider opportunities for health system drivers, service innovation at local levels and day-to-day clinical decision making for physiotherapists who care for older adults in hospital settings, as well as community settings including residential aged care. Furthermore, physiotherapists will be challenged to consider opportunities and risks associated with digital disruptions that are occurring in health services and society more broadly that are already impacting the provision of healthcare for frail older adults and are likely to transform clinical care models further in coming years.

#### Key Practice Points

- Frail older adults recovering after hospitalisation are at an elevated risk of re-hospitalisation, loss of functional independence, and death.
- Modifiable and non-modifiable contributors to these negative outcomes are likely to extend to an array of factors that may not (but perhaps should) be considered during clinical assessments and intervention planning.

## AN EVALUATION OF AUTONOMOUS NON-MEDICAL PRESCRIBING BY PHYSIOTHERAPISTS IN QUEENSLAND EMERGENCY DEPARTMENTS

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**Aim:** To investigate the patient experience and prescribing safety related to the implementation of trained and credentialed physiotherapist prescribers in Queensland Emergency Departments

**Design:** A descriptive study design using quantitative analysis.

**Method:** Emergency Physiotherapy Practitioners (EPPs) working in primary contact musculoskeletal roles within five emergency departments in Queensland completed prescribing training. Under Queensland legislative framework and Department of Health credentialing processes they have autonomous prescribing authority within the research pilot. From April 2017 to December 2019, all adult patients who may require prescribing to the extent necessary to enable EPP assessment and management are eligible for inclusion with data collected for safety, quality of prescribing and to assess the patient experience.

**Results:** As of May 2019, over 1400 participants have been recruited into the trial with approximately 1600 medication orders written by EPPs. No adverse outcomes have been recorded due to physiotherapy prescriber error and auditing of medication orders demonstrates comparable or better compliance with existing national medication charting guidelines reported data. Patient experience data shows very high levels of consumer confidence and satisfaction with physiotherapy prescribing.

**Conclusion:** Preliminary findings suggest that prescribing by trained and credentialed physiotherapists is safe. Moreover, consumers are confident and satisfied with this new model of care.

Key Practice Points:

- Physiotherapy prescribing can be implemented safely in an emergency department environment with high levels of consumer confidence and satisfaction, with potential to improve community access to timely and appropriate medicines.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Non-medical prescribing has the potential to increase access to medicines, particularly in rural and remote areas, and is therefore likely to benefit the Aboriginal and Torres Strait Islander population and all Australians.

## VIRTUAL REALITY EXERGAMING FOR CHRONIC LOWER BACK PAIN - WHAT WORKS BEST?

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**Aim:** This pilot trial explored a novel treatment method that may address both sensorimotor impairment and psychological barriers to exercise, such as kinesiophobia and low motivation. It is unclear whether immersive (IVR headset) or non-immersive (NIVR) gaming results in better outcomes.

**Design:** Feasibility study

**Method:** A convenience sample of 20 participants were recruited from 2 Sydney clinics. Eligibility: LBP > 3 months, with or without radicular leg pain, including those with a history of spinal surgery or spinal cord stimulators. Participants with CLBP trialled two forms of VR, and completed a User Perception Survey on their experience. Kinesiophobia levels were assessed via TSK-11 score. Volitional postural sway and movement during gaming were recorded on a Wii Board using the Balance Rite App. Data was analysed using SPSS.

**Results:** There was significantly more movement in NIVR than IVR for each participant ( $p = 0.017$ ). NRS and TSK did not predict this variation in movement within each individual. Romberg score was found to be a significant factor ( $p = 0.009$ ). Differences between subjects could best be explained by variation in TSK score ( $p = 0.004$ ), as well as level of pain ( $p = 0.012$ ).

**Conclusions:** IVR may be preferable for reducing level of pain, but NIVR results in increased active movement. This needs to be explored further in a randomised controlled trial.

Key Practice Points:

- VR is well tolerated in a CLBP population
- VR exergaming may address both kinesiophobia and sensorimotor impairment
- Both IVR and NIVR may have a role, depending on stage of rehabilitation

Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander peoples: There is potential for VR technology to be extended into home-based rehabilitation, greatly reducing healthcare access barriers. This opportunity could be extended to tele-rehabilitation, for those unable to access Metropolitan centres.

## EXTENDING THE BIOPSYCHOSOCIAL MODEL? INSIGHTS FROM CLINIC OBSERVATIONS

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**Aim:** To investigate how (and if) the psychosocial and related aspects of care manifest in the clinical management of people with chronic low back pain in a private practice setting.

**Design:** Qualitative methodology drawing data from ethnographic observations, collaborative discussions with physiotherapist and patients. Data were analysed with thematic analysis.

**Method:** Twenty physiotherapy consultations with patients with chronic low back pain were observed. We purposively sampled physiotherapists (10) and patients (20) from a medium size private practice with a mix of gender, age and chronicity (patients). Data were analysed thematically, and findings organised into interpretative themes.

**Results:** Three key themes were identified: “biological focus”, “human aspects (non-biological)”, and “power”. Participating physiotherapists often emphasised biological rather than ‘human’ aspects when treating participants with low back pain. In some consultations, patient-participants attempted to divert discussions to ‘human’ elements but this was rarely attended to by their physiotherapists. At times, power differences were apparent, with opposing views observed between physiotherapists and patients, especially regarding treatment options.

**Conclusion:** Findings suggest that despite recommendations in the literature, physiotherapists continue to have a biological focus when treating patients with low back pain, with minimal attention to ‘human’ aspects including psychosocial factors. Additionally, at times physiotherapists neglect patient’s preferences, indicating potential imbalances in power relationships.

### Key Practice Points:

- There continues to be a focus on biological aspects of care in physiotherapy interactions with low back pain patients
- Power imbalances can manifest in physiotherapist-patient relationships, particularly in relation to treatment decisions

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-indigenous population.

## ADVANCES IN CANINE AQUATIC TREADMILL THERAPY

Messum D

Canine hydrotherapy was originally thought of as swimming but aquatic treadmill therapy has been the game changer for the rehabilitation of many orthopaedic and neurological conditions within the veterinary industry. Aquatic treadmills combine the benefits of land-based exercise with the benefits of water: hydrostatic pressure, viscosity and the principle of buoyancy within a temperature-controlled environment. Aquatic treadmill therapy increases active range of joint motion, enhances muscle activation and strength, promotes normal motor patterns, improves dynamic stability and cardiovascular fitness. The aquatic treadmill also enables controlled joint loading, which helps nourish cartilage and enhance the production of synovia in the degenerative joint.

Canine studies have focused on the benefits of underwater treadmill therapy in cases of osteoarthritis, elbow dysplasia, cranial cruciate disease, obesity and fibrocartilaginous embolism. In addition to this literature, what can we learn from Equine and Human medicine literature and can this be applied to many of the other orthopaedic and neurological conditions that we see? Research has demonstrated that water depth, temperature and speed have a significant effect on physiological responses in humans. Whilst some canine studies have shown water depth can have a significant effect on biomechanical responses to aquatic treadmill exercise, we still don't know the combined effects of different treadmill speeds at different water depths and how muscle function adapts to generate the locomotion patterns seen.

#### Key Practice Points

- The benefits of water treadmill, what we know about how it works and what we don't yet have evidence for.

## BRACE YOURSELF: PELVIC LIMB ORTHOSES IN CANINE PRACTICE

Messum D<sup>1</sup>

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An orthosis is 'an externally applied device used to modify the structural and functional characteristics of the neuromuscular and skeletal system'. It is designed to control, guide, limit or immobilise an extremity, joint or body segment in a given direction. Protecting and reducing the load of a soft tissue structure immediately post injury or surgery is vital to ensure adequate healing and to prevent persistent instability, pain and weakness through premature loading. For the later phases of rehabilitation, orthoses limit and guide functional movement avoiding a transition from complete protection to full load and function of the healing structure. Orthosis design and owner compliance are key components to ensure a successful outcome is achieved. Evaluating different orthoses designs and their effect on gait enable us to make a more informed decision for clinical use.

We will examine the evidence for the use of custom-made orthoses in the conservative management of soft tissue pathologies of the pelvic limb. The pathologies will include cranial cruciate ligament deficiency, strain to the common calcaneal tendon and superficial digital flexor tendon lacerations. Due to the limited amount of research for the use of orthotic devices in veterinary medicine, deciding on the point at which tissue load should be increased remains a challenge.

#### Key Practice Points:

- Using tissue-healing timelines, existing evidence for the use of orthoses in human and veterinary medicine and by reviewing clinical cases, we will look at how to maximise your patient outcomes in canine practice.

## EVIDENCE BASED PRACTICE IN OCCUPATIONAL HEALTH AND SAFETY – IS IT TIME TO EXPLORE A NEW MODEL?

Milanese S<sup>1</sup>

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Complex interventions are characterised as interventions that contain several interacting components involving a number of groups or organisational levels, with flexibility or tailoring of the intervention and a number of outcomes considered. Occupational physiotherapy shares many of the characteristics of complex interventions. Evidence based practice (EBP) has traditionally focussed on a linear model of scientific exploration, with an outcome-centric approach that seeks to control for variables. Unfortunately, reality is often messy and the standardisation of approach favoured in the traditional EBP model is at odds with the notion of complex systems. Efficacy relates to the success of an intervention in a controlled environment,

whilst effectiveness relates to the success of an intervention in the real world. Health promotion advocates (including the WHO European working group on health promotion evaluation) have abandoned randomised controlled trials as the highest level of primary research as this research design precludes context level adaptation, which reduces effectiveness. As Occupational Physiotherapists, and insurance companies/regulatory bodies, increasingly focus on EBP to minimise the use of low value care options it is timely to explore what good EBP means. This presentation will explore the complex nature of Occupational Physiotherapy and how the current model of EBP needs to be re-visited to accommodate what makes this approach unique

Key Practice Points:

- Efficacy is different from effectiveness
- When reading research evidence related to a complex intervention such as occupational physiotherapy caution is needed to ensure context level adaptation

## PEYRONIE'S DISEASE AND THE ROLE OF THERAPEUTIC ULTRASOUND AS A NON-INVASIVE PHYSIOTHERAPY TREATMENT OPTION: A RANDOMIZED CONTROLLED TRIAL.

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**Aim:** Peyronie's Disease (PD) is an acquired connective tissue disorder affecting the tunica albuginea (TA) of the corpus cavernosum of the penis, causing physical and psychological burden in at least 50% of men affected.<sup>1-3</sup> Therapeutic Ultrasound (TUS) is a non-invasive treatment for soft tissue injuries, however research in PD is limited.<sup>4-7</sup>

**Design:** Using a minimisation approach, participants with confirmed PD were enlisted from a cohort referred sequentially, with each participant randomly allocated to one of two groups, 'intervention' or 'delayed entry' to form a randomised controlled trial.

**Methods:** Forty-six men with PD (n= 23 intervention, n= 20 control) were recruited. Each participant underwent Penile Duplex Doppler Ultrasound (PDDU) and completed the IIEF-5 and Peyronie's Disease Questionnaire (PDQ). Twelve TUS sessions were provided over 4 weeks utilising 1.5-2.5 W/cm<sup>2</sup>, 3 MHz x 10mins/session. The control group had 4 -week delayed entry into the intervention.

**Results:** Forty-three participants (59 y ± 11y, BMI=26.3, duration PD 17 months) completed the trial. PDDU outcomes indicated a Group x Time interaction (F= 4.702, p=0.036) and showed a significant main effect. Average reduction in penile curvature angle was 17°, or 38% of total. For the IIEF-5 outcomes, results show a significant main effect for the Group x Time interaction (F=4.752, p=0.035)

**Conclusions:** TUS offered an effective first line, non-invasive approach to treatment for PD as confirmed on PDDU, angle, erectile function and subjective reporting. Previous studies utilizing TUS on PD have relied on case study reports and this is the first RCT to be undertaken in this field.



## NEW PROTOCOLS FOR A FASTER RETURN TO CONTINENCE, ERECTILE DYSFUNCTION AND QUALITY OF LIFE FOLLOWING RADICAL PROSTATECTOMY: A RANDOMISED CONTROLLED STUDY UTILISING PELVIC FLOOR MUSCLE TRAINING.

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<sup>1</sup>University of Western Australia, Perth, Australia, <sup>2</sup>Liverpool John Moores University, Liverpool, England.

**Aim:** Pelvic floor muscle training (PFMT) for post-prostatectomy incontinence (PPI) and erectile dysfunction (ED) is considered a first line approach to rehabilitation, but protocols remain elusive. 1-5 Commencing pre-operatively, and utilising both fast and slow twitch fibre training performed in standing postures, new protocols were developed 6-8 and comparisons to 'usual care' rehabilitation were assessed.

**Design:** Using a minimisation approach, participants were enlisted from a cohort referred sequentially by their Urologist for pre-prostatectomy PFMT with each participant randomly allocated to one of two groups, 'usual care' or 'high intensity in a randomised controlled trial'.

**Methods:** Ninety seven men completed the trial, n=47 performing 'usual care' of 3 sets/day PFMT and n=50 performing 'high intensity', 6 sets/day in standing, commencing 5 weeks prior to prostatectomy. Participants were assessed pre-operatively and at 2, 6 and 12 weeks post-surgery using 24 hour pad weights, IPSS, EPIC-CP, IIEF-5 and real time ultrasound (RTUS) measurements of PFM function. 9,10

**Results:** Participants in the control group demonstrated a slower return to continence and experienced significantly ( $p<0.05$ ) more leakage. At 12 weeks post RP 74% of intervention group and 43 % of control group were continent. For ED, the intervention achieved significance ( $p<0.05$ ) at 2 weeks post-RP in EPIC-CP scores.

**Conclusions:** Utilising a higher intensity PFM exercise intervention protocol, PPI can be reduced in time and severity with less leakage and improved QoL outcomes. Early PFMT reduces post-prostatectomy ED impact, with faster return to continence enabling earlier commencement of penile rehabilitation and improved quality of life outcomes.

## WHAT IS THE EXPERIENCE, AND PERSONAL SIGNIFICANCE, OF SEVERE MOBILITY IMPAIRMENT FOR ADULTS WITH ACQUIRED BRAIN INJURY?

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**Aim:** To explore the experience of severe mobility impairment after brain injury, and the personal significance of mobility skills.

**Design:** Longitudinal qualitative descriptive.

**Method:** 10 adults with severe mobility impairment at eight weeks post-brain injury were interviewed up to three times over six months. Semi-structured interviews explored their experiences and priorities, with specific questions about mobility. Interview transcripts were coded independently by two researchers, then themes formed. A third researcher reviewed these against transcripts.

**Results:** Six themes were derived: I lost everything overnight; It feels frustrating; Walking is absolutely the most important; I need help; I'm making progress; I can start doing things that I used to be able to do. Many participants described overwhelming losses, with loss of mobility affecting many aspects of life. Recovery of

mobility was prioritised extremely highly, especially walking. All participants described that their mobility progress helped their wellbeing.

Conclusion: Mobility impairment had a devastating impact, related to loss of independence, control and dignity. All mobility achievements were highly valued, including assisted mobility.

Key Practice Points:

- Early facilitation of leave should be considered for those with severe mobility impairment, as many participants felt desperate to have time away from the rehabilitation hospital.
- Achieving assisted mobility was prized highly, including assisted standing, walking, car transfers, powered wheelchair mobility, and transfers without a lifter. Receiving respectful assistance was judged as crucial.
- Survivors of severe brain injury care about the methods of mobility they use. Optimising independence in the short-term, and building skills over time are important.

## WHAT IS THE RELATIONSHIP BETWEEN CHANGE IN STANDING POSTURAL ALIGNMENT AND MOBILITY FOR ADULTS AFTER ACQUIRED BRAIN INJURY?

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Aims: To determine change in mobility for people with severe mobility impairment after brain injury over 6 months, and the relationship between change in mobility scores and change in standing postural alignment.

Design: Longitudinal observational study.

Method: 14 adults who were severely impaired with mobility at eight weeks post-brain injury had 3D kinematic data recorded in standing and other anti-gravity positions at initial assessment, three months and six months. Data were analysed for the participants who could stand using rails at each time point (n = 11 – 13, dependent on time point). Positions of head, thorax, pelvis, thighs and shanks relative to the base of support were measured in the transverse plane, normalised and summed, to produce an alignment score. The primary mobility measure was the Clinical Outcome Variables Scale.

Results: Mobility scores improved significantly between baseline and 6 months ( $p < 0.001$ , mean change  $24.9 \pm 15.4$ , range -1 to 51). We identified a significant association between change in mobility score and change in alignment score ( $R^2 = 0.42$ ,  $\beta = -0.65$ ,  $p = 0.02$ ).

Conclusion: Participants who were severely impaired with mobility made significant improvements over six months. The relationship between mobility and anti-gravity postural alignment in standing may reflect that postural alignment has a significant influence on progress with mobility skills.

Key Practice Points:

- Severe mobility impairment at eight weeks post-brain injury did not preclude survivors from significant progress
- Whole-body postural alignment may be important to include in analysis and clinical reasoning after brain injury

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: These results are likely to have no greater impact on Aboriginal and Torres Strait Islander Australians.

## THE EFFECTS OF SERIAL CASTING ON LOWER LIMB FUNCTION FOR CHILDREN WITH CEREBRAL PALSY: A SYSTEMATIC REVIEW WITH META-ANALYSIS.

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**Aim:** To determine the effects of serial casting for the management of lower limb dysfunction in children with Cerebral Palsy (CP).

**Design:** Systematic review.

**Method:** A systematic literature search was conducted in February 2019 across eight databases (PUBMED, EMBASE, CINAHL, PEDro, OTSeeker, Cochrane, Scopus and Proquest) using key terms 'Cerebral Palsy' and 'serial casting'. Meta-synthesis and meta-analyses were undertaken showing the effect of serial casting on lower limb outcomes: Ankle range of motion; functional gait measures, hypertonicity, spasticity and; gross motor function.

**Results:** Twenty-five articles from 3219 possible citations were included. Serial casting was found to be effective for: Improving ankle dorsiflexion passive range of motion (PROM), functional gait measures and; decreasing hypertonicity. Serial casting post pharmacological intervention was effective for reducing spasticity. Serial casting (with and without the addition of pharmacological intervention) did not significantly improve gross motor function (GMFM) in the short-to-mid-term. Serial casting with pharmacological intervention was significantly more effective for improving ankle dorsiflexion PROM than serial casting alone (MD -3.19 degrees; 95% CI -5.76 to -0.62; p=0.01; I<sup>2</sup>=0%).

**Conclusion:** Lower limb serial casting without pharmacological intervention, improves several outcomes relevant to lower limb function supporting its clinical use for improving functional outcomes in children with CP. The effects may be slightly enhanced when coupled with pharmacological interventions.

**Key Practice Point:**

- Further research is indicated to explore long-term effects of serial casting on functional lower limb outcomes. Clinicians can use this information when developing individualised treatment plans for children with CP during shared decision-making consultations.

## LINKING THE ESSENTIAL CORE PAEDIATRIC COMPETENCIES IN ENTRY-LEVEL PHYSIOTHERAPY EDUCATION TO AN AUSTRALIAN ENTRY-LEVEL EXTENDED-MASTERS PHYSIOTHERAPY CURRICULUM: A CASE STUDY.

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**Aim:** To determine the extent to which an Australian entry-level extended-master's physiotherapy program i) aligns to Essential Core Competencies (ECCs) in Pediatrics - Academy of Pediatric Physical Therapy (APPT), ii) meets the International Organisation of Physical Therapists in Paediatrics content areas (IOPTP-CA's) - the minimum international standard for paediatric curriculum, and; iii) utilises paediatric curriculum to meet the Physiotherapy Practice Thresholds in Australia and Aotearoa New Zealand (PPTAANZ).

**Design:** Case study.

**Method:** An Australian entry-level extended-master's physiotherapy program was examined to identify pediatric-related concepts. Two independent reviewers mapped paediatric subject learning outcomes

(SLOs) and meaningful paediatric concepts (MCs) in the curriculum to the ECCs, IOPTP CA's, and PPTAANZ. Consensus was achieved using two additional physiotherapist reviewers.

Results: Nine (47%) subjects incorporated paediatric-related concepts accounting for 0.2-73% of the subjects' content. From 205 possible SLOs, 39 (19%) were paediatric-related. A total of 392 MCs were identified and mapped to ECCs, IOPTP-CA's, and PPTAANZ. Of the 60 combined ECCs, IOPTP-CA'S and PPTAANZ sub-criteria, 59 (98%) were covered within the examined paediatric physiotherapy curriculum.

Conclusion: Excellent representation of ECCs and IOPTP-CA's was apparent with strong representation from paediatric content towards the PPTAANZs. This mapping process highlighted the importance of accurate reporting to improve curriculum, identified potential gaps in paediatric content, and evidenced important elements in curriculum to maintain.

Key Practice Point:

- Future utilization of this linking-rules approach to map entry-level physiotherapy curriculum is recommended as a quality assurance process for meeting minimum national and international standards for inclusion of paediatric curriculum.

## PHYSIOTHERAPY STUDENTS' DiSC BEHAVIOUR STYLES CAN BE USED TO PREDICT THE LIKELIHOOD OF SUCCESS IN CLINICAL PLACEMENTS.

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Aim: To explore the behaviour styles of physiotherapy students and investigate if there is a relationship between students' unique behaviour patterns and their clinical placement grades.

Design: Cross-sectional study.

Method: This cross-sectional study with 132 (F=78, M=54) physiotherapy students was conducted across two Australian university settings. Measures included Everything DiSC Workplace profile, Assessment of Physiotherapy Practice (APP).

Results: Physiotherapy students (n=133) profiled: Dominance (D) style n=20 (15%), Influence (I) style n=33 (25%), Steadiness (S) style n=36 (27%) and Conscientiousness (C) n=44 (33%). Students with individual DiSC styles of i and Conscientiousness / Steadiness (CS) were in the lowest APP quartile for clinical grades and the D style was in the highest quartile. Binary logistic regressions revealed students with an i DiSC style had 3.96 times higher odds, and students with a CS DiSC style had 4.34 times higher odds, of failing a clinical placement. When explored independently, the same trend remained for Master's level students. Bachelor's level students with DiSC styles of S and C had failed placements, however these styles were not significantly associated with failure (DiSC S Style: Exp(B) 1.667, p=0.713 (CI: 0.109 to 25.433), DiSC C Style: Exp(B) 11.00, p=0.097 (CI: 0.646 to 187.166)).

Conclusion: Physiotherapy students with DiSC styles i and CS appear to be more likely to fail physiotherapy clinical placements. Further research with larger undergraduate samples is required to establish if relations differ for undergraduate versus postgraduate students.

Key Practice Point:

- Physiotherapy students' DiSC styles can predict the likelihood of success in clinical placement.

## DOES POSTURAL TRUNK MUSCLE DYSFUNCTION PRECEDE DEVELOPMENT OF PREGNANCY RELATED LOW BACK PAIN, PELVIC GIRDLE PAIN AND STRESS URINARY INCONTINENCE?

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**Aim:** To investigate whether changes in abdominal, spinal and pelvic floor muscle morphology and function are associated with the development of Pregnancy-related Low Back Pain (PRLBP), Pelvic Girdle Pain (PGP) and/or Stress Urinary Incontinence (SUI).

**Design:** This pilot study is a prospective, longitudinal, observational design.

**Method:** This study recruited 15 primiparous women enrolled to have their baby at a Brisbane public Hospital. There were five data collection points. Antenatal data was collected at 16-19, 26-29 and 36-39 weeks gestation. Postnatal data was collected at six and twelve weeks post-delivery. At each timepoint, muscle function and morphology was examined using Real-time Ultrasound imaging, assessment of posture, abdominal appearance and stability, in addition to reliable and valid questionnaires. R will be used for data analysis. Repeated measures analysis of covariance will be used to evaluate changes in muscle size and function across the five data collection timepoints and logistic regression analysis, to determine contributors to the development of Pregnancy-related SUI, LBP and PGP.

**Results:** Data collection will be finalised in September 2019.

**Conclusion:** This information will facilitate the design of a comprehensive musculoskeletal screening program to help identify and manage risk factors for postural muscle dysfunction during the childbearing year, thereby optimizing function during pregnancy.

### Key Practice Points:

- Increased understanding of changes to postural trunk muscle morphology and function during pregnancy
- Risk factor identification for development of common Pregnancy-related musculoskeletal and pelvic floor muscle conditions
- Screening programs to streamline targeted intervention for management of specific Pregnancy-related musculoskeletal dysfunction

## AN EXPLORATORY STUDY INTO THE USE OF BODY-SCANNING TO IMPROVE FUNCTION AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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**Aim:** This study investigated the potential use of body-scanning in post-anterior cruciate ligament reconstruction, in terms of performance ability effect on functional measures.

**Design:** Single-arm intervention study.

**Methods:** Thirty people >12 months post-anterior cruciate ligament reconstruction participated. Participants were asked if they were able to perform a body-scan (mentally visualise their knees), if so were there perceptual differences between the operated/non-operated sides, and if a brief body-scan intervention could improve any differences (results reported descriptively). The potential effect of a brief

body-scan intervention on immediate performance of functional measures (hopping, balance, strength) was assessed (reported as group statistics for overall change, and individual effect sizes using Minimal Detectable Change analysis to assess for potential responders).

Results: Most participants (96.7%) were able to perform a body-scan and most reported a side-to-side difference in perception (93.1%). Of those reporting a difference, 92.5% reported improved perception following the body-scan intervention. The results on group level showed statistically significant improvements after the body-scan intervention for horizontal hop, posteromedial reach and posterolateral reach. Around one third achieving a clinically meaningful change in at least one functional measure.

Conclusions: For some people body-scanning could be a useful adjunct in post-surgery anterior cruciate ligament rehabilitation.

Key Practice Points:

- Motor imagery is not a common component of post-anterior cruciate ligament reconstruction rehabilitation protocols.
- It is simple to implement with minimal cost, well within the scope of physiotherapists.
- It can assist function for some individuals.

## IMPLEMENTATION OF VENTILATOR HYPERINFLATION INTO CLINICAL PRACTICE: EVALUATION OF PRACTICE CHANGE IN A TERTIARY ICU

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Aims: Identify indications/patient populations in which ventilator hyperinflation (VHI) is used, identify adverse events associated with VHI and determine outcomes for those treated/not treated with VHI.

Design: Twelve-month prospective observational study in a tertiary ICU.

Method: All patients admitted to ICU, identified by physiotherapists as having an indication to perform VHI and no contraindications were included. Approval sought from the treating Intensivist. Outcomes included: Medical agreement to perform VHI, treatment indication, number of treatments, pre-defined adverse events, dynamic lung compliance, sputum clearance (measured from nursing charts/treatment session), PF-ratio (all measured pre/post treatment or over 4hours for patients not treated), CXR changes (measured daily, assessed by medical staff).

Results: Nineteen eligible patients, 53% received VHI. Treatment was most commonly indicated (37%) and performed (50%) in patients with spinal cord injury Main indication was sputum clearance (74%). Patients received median [IQR] 4.5[1.0-11.5] VHI treatments. No adverse events occurred. Main improvements post VHI episodes (could select multiple): lung compliance (71%), sputum clearance (26%), PF-ratio (23%) and CXR findings (19%). Across all episodes no significant improvement in PF-ratio ( $p=0.85$ )/lung compliance ( $p=0.14$ ) were observed. Patients not treated had improvements in PF-ratio (45%), lung compliance (36%) and CXR findings (27%). No patients had improved sputum clearance.

Conclusion: VHI was predominantly performed in patients with spinal cord injury, in particular those with sputum retention. No adverse events occurred in this small exploratory sample.

Key Practice Points:

- VHI can be safely implemented into clinical care
- Further review of VHI in a larger sample is warranted

## KINEMATIC DIFFERENCES OF THE CERVICAL AND THORACIC SPINE DURING FUNCTIONAL MOVEMENT IN PEOPLE WITH OR WITHOUT NECK PAIN

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**Aim:** Analyse differences in kinematics of the cervical and thoracic spine in people with or without chronic neck pain as they perform functional tasks.

**Design:** Systematic review.

**Methods:** Studies were included if they were in the English language and reported on kinematics of three-dimensional functional movement (movement based on real-world situational biomechanics, i.e., multi-planar movements) of the cervical and thoracic spine in individuals with and without neck pain. Two reviewers screened title/abstracts and full texts and assessed study quality.

**Results:** From 4,416 title/abstracts, 11 full texts were retrieved. Reasons for exclusion were participants  $\leq 18$  years of age and studies that did not investigate functional movement. Included studies (n=5) used 3D motion analysis to assess kinematics during functional tasks including typing, gaming and resting posture. Studies had clearly defined outcome measures, but quality was affected by non-blinding of assessors. Results provide Level 3 evidence that individuals with chronic neck pain display greater neck flexion postures, reduced head velocity and smoothness of movement.

**Conclusion:** Though few studies were identified, altered kinematics were observed in individuals with neck pain, suggesting further research examining cervical spine kinematics is warranted to assist clinicians to recognise possible movement risk factors that may be targeted with treatment.

**Key Practice Points:**

- Understanding specific differences in cervical 3D kinematics in individuals with chronic neck pain provides clinicians with a foundation to enhance their physical examination and tailor exercises more effectively.

## EDUCATIONAL STRATEGIES TO HEIGHTEN LEARNING AND SOFTEN TRANSITIONS IN THE WORKFORCE

Molloy E

Learning in the workplace is necessarily complex due to the high stakes nature of healthcare, and the diversity and interaction of systems, artefacts, patients, learners and supervisors. Moving between contexts at any point in the career creates an additional set of demands including 'getting to know what goes on around here', how to access learning opportunities, be safe, and manage impressions. In this presentation, I will problematize 'transitions' and present two key arguments for how we might better help practitioners (novices and experts alike) better transition into new practice contexts.

Firstly, identifying and purposefully designing 'pedagogically rich activities' within the workplace can speed up knowledge and skill development. Equipping physiotherapists for how to engage in these work-embedded learning activities can result in many benefits for workforce development. This means that when we say physiotherapists are work-ready, it also means that they are workplace learning ready- including knowing what different people, and different types of performance-relevant information can offer them in evaluating and refining their own practice.



Secondly, 'Intellectual Candour' will be presented as a mechanism to reduce power asymmetries, promote belonging and encourage knowledge co-construction during workforce transitions. Intellectual candour "is characterised by brainstorming, improvisation and disclosure for the purpose of one's own learning and the learning of others" (Molloy & Bearman 2018 p.1). I present research findings that demonstrate the importance of reciprocal vulnerability in order to create trust and learning within a busy work environment, and of course, the risks in revealing too much.

#### Key Practice Points:

- Understanding the key tenets of transitions in the workforce can help to better prepare practitioners for these interfaces
- Pedagogically rich activities (PRAs) need to be identified, and in some cases, purposefully engineered, to help practitioner development in the workforce
- Peers and supervisors within the workplace play a key role in facilitating or hindering transitions in practice. Intellectually candid exchanges between these parties can help to establish trust, and create opportunities for co-construction of knowledge.

## THE EFFECTS OF LONG-TERM EXERCISE AND STOPPING LONG-TERM EXERCISE ON DEPRESSIVE- AND COGNITIVE-LIKE SYMPTOMS, AND HIPPOCAMPAL NEUROBIOLOGY

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Background: Research in psychiatry is revealing the intimate involvement of the immune system in the pathogenesis and pathophysiology of major depressive disorder (MDD) and cognitive dysfunction. Pro-inflammatory immune signalling proteins including tumour necrosis factor (TNF) are thought to contribute to inflammation in the brain that is associated with the severity of depressive and cognitive symptoms, and partial or non-response to pharmacotherapies. Limited treatment efficacies to date have necessitated research into alternative treatments, including physical exercise. Regular physical exercise is an effective adjunctive or stand-alone treatment for mild to moderate MDD in adults, including in the peri-natal period and in older people. Interestingly, immune mechanisms may contribute to this efficacy, including exercise associated changes in TNF levels and TNF signalling in the periphery and in the brain.

Objectives: To present:

- i) The effects of regular physical exercise on depressive and cognitive symptoms,
- ii) Preclinical research investigating
  - a. the TNF mediated effects of long-term exercise on depression- and cognition-like behaviours in middle adulthood;
- iii) The noteworthy effects of stopping exercise on behaviours and hippocampal neurobiology in middle age.

#### Key Practice Points:

- Interpreting preclinical research findings for clinicians
- Understanding the
  - \* Exercise dose for MDD (adults, pregnancy, older people)
  - \* Adverse effects of stopping exercise on depressive symptoms

## PROFILE OF HOSPITAL ADMISSIONS FOR ADULTS WITH CEREBRAL PALSY: A COHORT STUDY

**Morgan P<sup>1</sup>**, Enticott J<sup>2, 3</sup>

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**Aim:** To profile acute hospital admissions for a cohort of adults with cerebral palsy.

**Design:** Observational cohort study

**Method:** Five years of data routinely collected at Monash Health was interrogated to identify acute inpatient health service use by adults with cerebral palsy in the large Victorian catchment. Admission types were described, and comorbidities categorised using ICD-10 codes. Exploration of falls and injury data was undertaken.

**Results:** 810 admissions of adults with cerebral palsy, median age 40.0yrs (IQR 31yrs), were identified. Admission frequency for an individual adult ranged from 1-38 times over the period. Preliminary analysis revealed significantly higher proportion of admissions in adults with cerebral palsy via Emergency Department compared to paediatric admissions at the same facility (63%, 24%,  $p<0.001$ ). Main admission reason in the adult dataset was gastrostomy dysfunction. Aspiration pneumonitis was the second most frequent admission diagnosis. Eighty-three soft tissue or fracture injuries were coded for the admissions (upper limb,  $n=23$ ; pelvis/lower limb,  $n=33$ ), and 20 admissions were fall-related (slip/trip,  $n=11$ ; fall from bed/chair,  $n=9$ ).

**Conclusion:** Adults with cerebral palsy in this cohort access acute hospital services predominantly for emergency care. Gastrostomy and respiratory issues are key admission reasons. Greater exploration of injuries and fall-related admissions in this population would facilitate health promotion targets, potentially reducing acute hospital burden.

**Key Practice Points:**

- In contrast to children with cerebral palsy, adults access acute hospital services primarily for emergency care
- Gastrostomy dysfunction and aspiration pneumonitis are main admission reasons
- Injury and falls in this population may suggest health promotion targets

## OPTIMISING FUNCTIONAL MOBILITY IN YOUNG ADULTS WITH CEREBRAL PALSY

**Morgan P<sup>1</sup>**

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**Background:** The majority of people living with cerebral palsy (CP) in Australia are adults. There is emerging evidence of musculoskeletal consequences and mobility decline associated with aging, and increased prevalence of non-communicable diseases in this population. Despite this knowledge, little emphasis on an active health promotion approach is taken, with inconsistent engagement with health services by adults with CP evident.

**Design:** Narrative review

**Method:** Evidence relating to age-related health problems will be explored and information synthesised. Effective physiotherapy strategies for remediation will be identified.

Results: Adults with cerebral palsy experience earlier and more prevalent age-related health problems such as pain, fatigue, contracture, sarcopenia, circulatory and respiratory disease, diabetes and arthritis. Around 40% of ambulant adults with CP will stop walking or experience gait decline in early/middle adulthood. Physical inactivity is a significant contributor to decline. Physiotherapy interventions including body shape management, strength and gait training, balance re-education and falls prevention strategies may optimise functional mobility in young adults with cerebral palsy.

Conclusion: Young adults with CP are at risk of functional decline and increased mortality associated with non-communicable diseases. Greater focus on health promotion and self-management strategies by physiotherapists, particularly during paediatric transition, may optimise health related outcomes for adults with CP.

#### Key Practice Points:

- Adults with CP experience earlier and more prevalent non-communicable diseases than age-matched peers
- Many ambulant adults with CP stop walking or experience gait decline
- Physical inactivity is a major contributor to functional decline in this population
- Health promotion should be a focus of physiotherapy interventions

## YEAR IN REVIEW: EXERCISE FOR CHRONIC CARDIAC CONDITIONS

**Morris N<sup>1,2,3</sup>**

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This 'year in review' session will identify key research published in the past 2 years concerning exercise-based rehabilitation, with a focus on patients with chronic cardiac conditions such as heart failure and pulmonary hypertension. Presented by an experienced researcher, attendees will gain insight as to how these studies might influence practice, and, future challenges and directions in this field. Year in review sessions are a brief but effective way to be orientated to current research from across the world and understand the evidence base for clinical practice.

## THE PATHOPHYSIOLOGY OF PULMONARY HYPERTENSION: WHY MIGHT EXERCISE BE AN ISSUE?

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**Background and Aim:** Pulmonary hypertension (PH) is characterised by the chronic elevation of pulmonary artery pressure and pulmonary vascular resistance which lead to right ventricular remodelling and hypertrophy. The disease has complex aetiology and pathophysiology and is associated with a unique cardiorespiratory response to exercise. Until recently regular exercise has not been recommended for PH and exercise has been associated with severe adverse events (1). The aim of this presentation is to present data from our studies examining the acute response to exercise in PH.

**Design and Methods:** Three of our studies will be reviewed which examined acute responses to exercise. In the first study (2), nine PH patients and nine controls undertook submaximal exercise whilst cardiac function was measured using cardiac magnetic resonance imaging (2). In the second study (3) the physiological responses to the six minute walk test were compared using gas exchange between three groups of PH. In

the final study (4) we examined the relationship between the degree of desaturation during exercise and gas exchange in PH.

Results: In the first study (2) we found that individuals with PH have no right ventricular contractile reserve during exercise when compared to healthy controls. In the second study(3), we found that gas exchange measures did not differentiate between PH groups, however individuals with more severe disease had poorer gas exchange indices during exercise. Finally (4) we showed that in congenital heart disease-related PH, the degree of desaturation was related to a greater ventilatory response during exercise.

Conclusion and Practice Points:

- These results highlight the abnormal physiological response to exercise in pulmonary hypertension and will provide clinicians/researchers with a greater understanding of the pathophysiology of PH.

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## SAD AND BREATHLESS: NEGATIVE MOOD WORSENS EXERTIONAL DYSPNOEA IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

**Morris N<sup>1</sup>**, Scheffer K<sup>1</sup>, Sharma P<sup>1</sup>, Louis M<sup>1</sup>, Adams L<sup>1</sup>

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**Aim and Rationale:** Exertional dyspnoea is a debilitating symptom that is often associated with anxiety/depression affecting mood. We have previously shown that in healthy individuals, inducing a negative mood state increased intensity of exertional dyspnoea (1, 2). This study examined the effect of a negative mood state on exertional dyspnoea in individuals with COPD.

**Methods:** Nineteen individuals (11 females, 69±6 yr) with mild COPD (forced expiratory volume in one second= 65±15%) and six minute walk distance of 490±83m participated. Each subject completed a 5-minute walking test on three separate days. Subjects were shown images designed to alter mood (International Affective Picture System) during each test. Dyspnoea (intensity) and leg fatigue were recorded every minute using a 0(none) to 10(extreme shortness of breath) scale. Prior to and at the end of the test, mood was measured using a 0(extremely unhappy) to 10(extremely happy) scale. Dyspnoea (bother) was measured pre/post each test (0-10 scale).

**Results:** There was no significant difference in exercise heart rate or oxygen saturation between trials. Mood was significantly ( $p<0.01$ ) reduced in the final minute of the negative ( $2.4\pm1.3$ ) compared to the neutral ( $6.4\pm1.5$ ) and positive ( $7.6\pm1.3$ ) tests. End-exercise dyspnoea intensity and bother were both significantly greater ( $p<0.05$ ) during the negative trial (intensity:  $5.6\pm1.5$ ; bother:  $5.6\pm1.9$ ) compared to the neutral (intensity:  $4.5\pm1.5$ ; bother:  $4.0\pm1.9$ ) and positive trials (intensity:  $4.7\pm1.9$ ; bother:  $3.5\pm2.2$ ). However, there was no significant difference for leg fatigue between tests.

**Conclusion:** Negative mood state is associated with greater intensity of exertional dyspnoea. However, leg fatigue appears unchanged by mood, suggesting that the sensory response to exercise (dyspnoea vs leg fatigue) are processed differently by the brain.

Practice Points:

- Strategies to modify mood may impact on exertional breathlessness and in chronic disease.
- Modifying both positive and negative mood on a daily basis may improve exercise tolerance

#### References:

Sharma et al. *J Appl Physiol*. 2016. 120:114-20

Sharma et al. *Thorax*. 2019.(accepted)

## PEDro SEARCHING TO ANSWER QUESTIONS ABOUT THE EFFECTS OF NEUROLOGICAL PHYSIOTHERAPY COULD BE IMPROVED

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**Aim:** Evaluate the content of Physiotherapy Evidence Database (PEDro; [www.pedro.org.au](http://www.pedro.org.au)) searches about the effects of neurological physiotherapy compared to all other areas of practice.

**Design:** Observational study.

**Method:** Google Analytics was used to access all search commands entered in the PEDro simple and advanced search interfaces between 1 August 2017 and 31 January 2018. Random samples of 200 simple and 200 advanced search commands were evaluated. The frequency of search errors (e.g. Boolean operators) and use of sophisticated features (e.g. truncation) were extracted and two researchers independently coded the area of practice and PICO elements (Population; Intervention; Comparison; Outcome). Searches for neurology were compared to all other areas of practice.

**Results:** Among 1,254,697 search commands, 13% were related to neurology (12.5% simple and 14.5% advanced), making it the second most searched area of practice. The ratio of simple:advanced searches was 71:29 overall and 68:32 for neurology. Simple searches in neurology contained fewer errors (12% vs. 19%), used fewer sophisticated features (0% vs. 8%), and specified fewer PICO elements (40% vs. 44% contained ≥2 PICO elements) compared to all other areas of practice. Advanced searches in neurology contained more errors (21% vs. 16%) and used similar sophisticated features (10% vs. 10%) and PICO elements (59% vs. 57%) compared with other areas of practice.

**Conclusion:** Skills in searching appears to be a barrier to implementing evidence-based physiotherapy.

#### Key Practice Points:

- Devise a PICO question before doing a search
- Use the advanced search interface
- Use sophisticated features and avoid errors.

## TWO DECADES OF PAIN SCIENCE EDUCATION: FAILURES, OPPORTUNITIES AND THE PAIN REVOLUTION.

Moseley L<sup>1</sup>

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Pain Revolution is a multi-level, highly collaborative movement, aiming to mobilise consumer-driven pressure to change community norms, so as to push clinical care for people in pain away from low value, expensive and risky care, towards high value guideline-based care. Physiotherapy is a key component of first-line care for most musculoskeletal pain states, which almost universally recommend education, physical activity and self-management skills. Pain Revolution strategies align with recent calls for broad public health education campaigns but focus also on community engagement and across-sector

collaboration. In this talk, I will present the rationale behind Pain Revolution, which draws on extensive investigation of clinician perspectives on the Biopsychosocial model, as well as contemporary thinking in: pain science, learning science, health promotion, behaviour change, implementation science and community engagement. I will present failings of pain education since its inception two decades ago, challenges that face the pain education field, and new research on the perspectives that recovered patients have about pain education and clinical care within the context of their recovery. I will provide an overview of Pain Revolution's strategies including the actual and potential role of the physiotherapist in delivery, mentoring and facilitating community education. I will outline Clinician-as-Scientist implementation and capacity building programs that dovetail with community education strategies, focussing on impacts, challenges and opportunities.

Key Practice Points:

- Participants will gain an understanding of Pain Revolution rationale and strategies.
- Participants will gain an understanding of what recovered patients attribute their recovery to and how the physiotherapist might facilitate recovery by strategic conceptual change.
- Participants will learn about mistakes, challenges and opportunities to improve their own education efforts.
- Participants will learn about new opportunities for physiotherapists as pain and health educators.

## HOW TO SEARCH PEDro TO ANSWER CLINICAL QUESTIONS

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<sup>1</sup>*Institute for Musculoskeletal Health, School of Public Health, The University of Sydney, Camperdown, Australia*

Background: Evidence-based practice starts with asking a clinical question then navigating the large volume of published articles to acquire high-quality clinical research that answers the question. Unfortunately, clinicians exhibit difficulty with both of these steps. An analysis of 1.3 million PEDro searches indicated that only 50% of searches specified two or more of the key elements of a clinical question (PICO elements: Population, Intervention, Comparator, Outcome), 4% used features that improve the efficiency of searching (e.g. truncation), and 13% contained errors (e.g. Boolean operators).

Aims: This session aims to facilitate evidence-based practice by developing participants' knowledge and skills in asking clinical questions and acquiring evidence using PEDro.

Objectives:

1. Devise a PICO question from a clinical scenario
2. Generate search terms for each element of the PICO question
3. Conduct a PEDro search to identify high-quality clinical research to answer the clinical question.

Approach: This session involves demonstrations and will promote audience engagement through:

- participants nominating clinical scenarios that will be used to generate PICO questions
- exploration of search terms for the elements of the PICO questions
- designing initial search strategies for PEDro
- refining the search strategies to identify high-quality clinical research to answer the questions.

Key Practice Points:

- Following this session, participants will be confident in asking the 'right' clinical question, and designing and adapting a search strategy in PEDro to find the answer.
- These learning outcomes will contribute to physiotherapists' ability to apply strategies to systematically access high-quality clinical research.

## IS PAIN SCIENCE RELEVANT IN PELVIC PAIN?

Moseley L<sup>1</sup>

<sup>1</sup>University of South Australia, Adelaide, Australia

Odd title that's for sure because it is clearly a no-brainer. Or a brainer perhaps – contemporary pain science itself clearly points to the anatomical location of one's pain bearing no relevance to whether or not the pain should be considered scientifically. This might seem an obnoxious position to take, but anecdotally, and in the clinical literature, there seems a common view that 'pelvic pain is different'; that the principles of pain science that apply elsewhere have less relevance here. In this talk I will present evidence to support this common view point and my own rebuttal of that view. I will rely on basic neurophysiological and neuromodelling data from three fields and clinical outcome data from my own research and practice. I will suggest that the outcomes of treatment approaches based on pain science application are similar for pelvic and non-pelvic pain. I will highlight observations that suggest nuanced differences that may have clear clinical implications.

### Key Practice Points:

- Participants will gain an understanding of the relevance of modern models of brain function to pelvic pain.
- Participants will gain an understanding of outcomes of contemporary pain education and care for those with pelvic and non-pelvic pain.
- Participants will learn about what recovering or recovered patients with pelvic pain attribute their progress to.

## SIMULATION PROVIDES A MORE ROBUST, EFFICIENT AND TIMELY MODEL FOR ASSESSMENT OF PHYSIOTHERAPY COMPETENCY

Moss P<sup>1</sup>, Lee D<sup>1</sup>, Te M<sup>2</sup>, Pritchard S<sup>1</sup>, Barnett-Harris A<sup>1</sup>, Patman S<sup>1</sup>, Gupta K<sup>1</sup>, Sievers N<sup>1</sup>, Blackstock F<sup>1,2</sup>

<sup>1</sup>Australian Physiotherapy Council, Melbourne, Australia, <sup>2</sup>Western Sydney University, Sydney, Australia

**Aim:** To examine the validity and viability of simulation-based assessment for increasing the efficiency and scalability of assessment of clinical competency against Binational Physiotherapy Practice Thresholds.

**Design:** Two sequential studies, both of which used randomised, controlled designs.

**Methods:** Both studies were undertaken at purpose-built simulation suites in Melbourne and Sydney. Participants completed simulation-based assessments with standardised patient cases mapped to Physiotherapy Practice Thresholds. In Study 1 (n=25, Proof of Concept), participants completed, in random order, three simulation-based assessments (one per core area) and three matched hospital-based assessments. In Study 2 (n=125), participants also completed three simulation-based assessments but only one hospital-based assessment, core area randomly allocated. In all assessments; participants were assessed by two independent assessors. Chi2 compared equivalence in pass/fail rates, and binary logistic regression examined predictors of pass/fail in the hospital-based assessment. Ethics approval was obtained (WSU - H12123/H12518).

**Results:** There was an overall 63% equivalence in Pass/fail rates (Chi2 13.79, p<0.001). Performance in simulation-based assessments was a significant predictor for pass in hospital-based assessments (overall OR 2.90, p<0.001; musculoskeletal OR 8.93, p<0.001). Through-put of assessments increased from a mean of 54 (SD=8.0) to 89.5 (SD=20.5) per month, with waiting times declining from 20 to 2 months.

**Conclusions:** Simulation-based assessments showed good equivalence to hospital-based assessment, providing a more efficient and robust model for competency assessment.



#### Key Practice Points:

##### Simulation-based assessment:

- Is a viable clinical assessment model;
- Is comparable and more robust than hospital-based assessment
- provides more opportunity for patient standardisation with scenarios that map closely to competencies.

#### Proposed Impact (to Aboriginal and Torres Straits Islander Health Outcomes)

Sourcing Indigenous patients for clinical assessments is challenging, and so the majority of candidates are not assessed for Indigenous healthcare practice. Simulation can incorporate clinical assessment of cultural safety and responsive practice.

### DEVELOPMENT OF A VIABLE PROCESS FOR WRITING VALIDATED CASE SCENARIOS FOR SIMULATION-BASED ASSESSMENT OF COMPETENCY TO PRACTICE.

Moss P<sup>1</sup>, Lee D<sup>1</sup>, Te M<sup>2</sup>, Pritchard S<sup>1</sup>, Barnett-Harris A<sup>1</sup>, Patman S<sup>1</sup>, Gupta K<sup>1</sup>, Sievers N<sup>1</sup>, Blackstock F<sup>1,2</sup>

<sup>1</sup>Australian Physiotherapy Council, Melbourne, Australia, <sup>2</sup>Western Sydney University, Sydney, Australia

**Aim:** To develop a financially sustainable, valid and peer-reviewed process for creating standardised case scenarios for Australian Physiotherapy Council assessments, used in two studies comparing the equivalence of simulation-based and “real-life” hospital assessments.

**Design / Method:** A five stage process was implemented: 1) Scenarios were planned as a suite of three cases mapped across the Binational Physiotherapy Practice Thresholds; 2) Scenarios, scripts and accompanying medical resources were then drafted by expert physiotherapy clinicians with experience writing simulation scenarios; 3) Scenarios underwent an iterative peer review process involving ≥three different clinical and simulation experts across three Australian states to confirm content validity, practicality and accuracy; 4) Actors were trained; 5) Scenarios were reviewed post-implementation by actors, assessors and the project administration team.

**Results:** Initial implementation demonstrated the need for a more complex approach to writing for assessment. Compared to scenarios developed for education and training, a higher degree of standardisation, authenticity and more comprehensive actor scripts were key to facilitating a fair assessment of candidates’ performance. Increased emphasis on the peer-review stage was also needed to resolve local health system-based variability. These refinements resolved initial implementation difficulties.

**Conclusions:** Development of a robust simulation-based scenario writing process ensured that the inevitable variability of assessments in hospitals using real patients was eliminated, allowing for a more accurate assessment of entry-level competence.

#### Key Practice Points

- Writing for assessment differs from writing for education and learning.
- Simulation-based assessment offers improved standardisation compared to hospital-based assessments through the opportunity to create scenarios that map to competencies.

#### Proposed Impact (to Aboriginal and Torres Straits Islander Health Outcomes)

Currently it is challenging to source Indigenous patients for clinical assessments, and the majority of candidates are not assessed for Indigenous healthcare practice. Simulation allows the incorporation into clinical assessment of cultural safety and responsive practice.

## AN EVALUATION OF TAILORED FALLS EDUCATION DELIVERED BY PHYSIOTHERAPISTS IN HOSPITAL TO FACILITATE OLDER ADULT ENGAGEMENT IN EXERCISE AFTER DISCHARGE

**Naseri C<sup>1</sup>**, McPhail S<sup>2,3</sup>, Morris M<sup>4</sup>, Haines T<sup>5</sup>, Etherton-Beer C<sup>6,7</sup>, Shorr R<sup>8,9</sup>, Flicker L<sup>7</sup>, Bulsara M<sup>10</sup>, Netto J<sup>11</sup>, Lee D<sup>5</sup>, Francis-Coad J<sup>12</sup>, Waldron N<sup>13</sup>, Boudville A<sup>14</sup>, Hill A<sup>1</sup>

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**Aim:** To evaluate a tailored falls prevention education program in facilitating exercise engagement of older adults within six months after hospital discharge.

**Design:** A quantitative evaluation of an RCT. Participants (N=390) were 60 years and over with good cognition discharged home from 3 rehabilitation hospital in Perth WA. Outcomes were participant engagement in exercise measured using a structured survey at six-months post-discharge.

**Results:** 292 participants (76.4%) were eligible to complete the six-month survey (n=149 intervention, n=143 control). There were no significant differences between groups in exercise engagement [AOR 1.3 (95%CI, 0.7, 2.2), p=0.3]. At baseline, the predominant exercise was walking, and an unsupervised home program at six-month follow-up. While 30% more participants in both groups were exercising at six-months compared to baseline, most (60%) were exercising for less than 1 hour per week (SD =1.12), which was considerably less than their baseline level of 3 hours per week, and less than recommended fall prevention guidelines.

**Conclusion:** Older adults showed reduced engagement in falls prevention exercise after hospital discharge. Further tailored support that extends beyond hospital discharge is warranted, to support older adults to overcome barriers to engage in falls prevention exercise.

### Key Practice Points:

- Findings suggest that older adults recently discharged from hospital faced barriers to completing exercise.
- Tailored education may be optimally provided over an extended period that includes when the older adult is in hospital and after their return home.

Proposed impact on health outcomes of Aboriginal and Torres Strait Islander people: the tailored education program may incorporate culturally appropriate context for the Aboriginal and Torres Strait Islander population.

## EVALUATION OF TAILORED EDUCATION DELIVERED BY PHYSIOTHERAPISTS IN HOSPITAL ON OLDER ADULT FALLS PREVENTION BEHAVIOUR AFTER DISCHARGE

**Naseri C<sup>1</sup>**, McPhail S<sup>2,3</sup>, Morris M<sup>4</sup>, Haines T<sup>5</sup>, Etherton-Beer C<sup>6,7</sup>, Shorr R<sup>8,9</sup>, Flicker L<sup>7</sup>, Bulsara M<sup>10</sup>, Netto J<sup>11</sup>, Lee D<sup>5</sup>, Francis-Coad J<sup>12</sup>, Waldron N<sup>13</sup>, Boudville A<sup>14</sup>, Hill A<sup>1</sup>

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**Aim:** To evaluate a tailored education program in facilitating older adult knowledge, motivation and engagement in falls prevention strategies within six-months after hospital discharge.

**Design:** A quantitative evaluation of an RCT. Participants (N=390) were 60 years and over with good cognition discharged home from 3 rehabilitation hospital in Perth WA. Outcomes were participant knowledge, motivation and engagement in falls prevention strategies, measured using a structured survey at six-months follow-up.

**Results:** 292 participants (76.4%) were eligible to complete the six-month survey (n=149 intervention, n=143 control). The tailored education significantly improved knowledge (-0.4, 95%CI -0.7, -0.2, p<0.01) and motivation (-0.8, 95%CI -1.1, -0.5, p<0.01) to engage in falls prevention strategies at the time of discharge. There were no significant differences between groups in falls prevention engagement at six-months, including receiving ADL assistance [AOR 1.3 (95%CI 0.7, 2.1), p=0.3], completion of home modifications [AOR 1.2, (95%CI 0.7, 1.9), p=0.4], and exercise [AOR 1.3 (95%CI, 0.7, 2.2), p=0.3].

**Conclusion:** Tailored education enabled older adults to gain knowledge and motivation to engage in falls prevention at the time of their hospital discharge, but they still faced barriers to engagement within six-months after returning home from hospital.

### Key Practice Points:

- Findings suggest that tailored education may be optimally provided over an extended period that includes when the older adult is in hospital and after their return home, to facilitate engagement in falls prevention and recovery of independence.

Proposed impact on health outcomes of Aboriginal and Torres Strait Islander people: the tailored education program may incorporate culturally appropriate context for the Aboriginal and Torres Strait Islander population.

## DESIGN OF A MOBILE PHONE SHORT MESSAGE SYSTEM (SMS) INTERVENTION TO SUPPORT HOME EXERCISE FOR PEOPLE WITH KNEE OSTEOARTHRITIS

**Nelligan R<sup>1</sup>**, Hinman R<sup>1</sup>, Atkins L<sup>2</sup>, Bennell K<sup>1</sup>

<sup>1</sup>University Of Melbourne, Carlton, Australia, <sup>2</sup>University College London, Centre for Behaviour Change, London, United Kingdom

**Aim:** To develop a behaviour change SMS intervention to support exercise adherence in people with knee osteoarthritis.

**Design:** Intervention design applying The Behaviour Change Wheel (BCW) framework.

**Methods:** The intervention was developed in two phases. Phase one involved using the BCW to select the target behaviour and associated barriers/facilitators/behaviour change techniques (BCTs). Phase 2 involved design of the program functionality and message library.

**Results:** The target behaviour was identified as participation in home-based strengthening exercise three times a week for 24-weeks. Thirteen barriers and nine facilitators of the behaviour and 20 BCTs were selected to use in the intervention. 198 messages were developed and organised into a 24-week automated program that functions by prompting users to self-report the number of home exercise sessions completed each week. Users who report  $\geq 3$  exercise sessions/week (adherent) receive a positive reinforcement SMS. Users who report  $< 3$  exercise session/week (non-adherent) are asked to select a barrier (from a standardised list) that best explains low adherence. This triggers a SMS containing a BCT suggestion relevant to overcoming the selected barrier. Users also receive SMS to facilitate exercise adherence, irrespective of self-reported adherence.

**Conclusions:** The BCW can be applied to guide development of an automated SMS intervention to support exercise adherence in knee OA.

**Key Practice Points:**

- This evidence- and theory-based SMS program can be provided to people with knee OA to facilitate adherence to prescribed strengthening exercise.

**Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander people:** This research has the potential to support Aboriginal and Torres Strait Islander people with knee OA adhere to prescribed strengthening exercise.

## TELEREHABILITATION VERSUS TRADITIONAL CARE FOLLOWING TOTAL HIP REPLACEMENT – A RANDOMISED CONTROLLED NON-INFERIORITY TRIAL

**Nelson M<sup>1,2</sup>**, Bourke M<sup>2</sup>, Crossley K<sup>3</sup>, Russell T<sup>2</sup>

<sup>1</sup>QEIJ Jubilee Hospital - Metro South Health, Brisbane, Australia, <sup>2</sup>The University of Queensland, Brisbane, Australia, <sup>3</sup>La Trobe University, Melbourne, Australia

**Aim:** Determine if outpatient physiotherapy care via telerehabilitation is non-inferior to in-person physiotherapy care after total hip replacement.

**Design:** Randomised, single-blind, controlled, non-inferiority clinical trial.

**Methods:** Seventy patients receiving a total hip replacement at QEII Jubilee Hospital entered the study, sixty-nine completed the study.

The control group received in-person outpatient physiotherapy and a paper-based home exercise program. The intervention group received remotely delivered telerehabilitation directly into their homes and a technology-based home exercise program using an iPad application. The primary outcome was the quality of life subscale of the Hip disability and Osteoarthritis Outcome Score. Secondary outcomes included objective strength and balance outcomes, self-reported function and satisfaction outcomes, and home exercise program compliance.

Results: No between group difference was detected in the primary outcome at the primary end point of six weeks (mean difference 2, 95% CI -10 – 13,  $p = 0.97$ ). Secondary outcomes showed no between group differences. Overall satisfaction was high across both groups, with the intervention group scoring higher for ease of attending appointments (intervention 95 (10), control 86 (18), mean difference 9 (95% CI 2 - 16),  $p = 0.017$ ).

Conclusions: Telerehabilitation for total hip replacement patients achieves non-inferior physical and functional outcomes compared to in-person rehabilitation.

#### Key Practice Points:

- Telerehabilitation can be delivered directly into the homes of total hip replacement patients
- Telerehabilitation achieves non-inferior outcomes to traditional care in the total hip replacement population

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people  
The results of this study could improve healthcare access to Aboriginal and Torres Strait Islander people who have difficulty travelling to hospital facilities.

## COMPARISON OF EMERGENCY PHYSIOTHERAPY PRACTITIONER PRESCRIBERS VERSUS EXISTING EMERGENCY DEPARTMENT PRESCRIBERS FOR MUSCULOSKELETAL INJURIES

Gridley K<sup>1</sup>, Strudwick K<sup>1</sup>, Pink E<sup>1</sup>, Nelson M<sup>1</sup>

<sup>1</sup>QEII Jubilee Hospital, Metro South Health, Brisbane, Australia

Aim: To compare prescribing practices of emergency physiotherapy practitioners to medical and nursing staff, for patients with musculoskeletal injuries in the emergency department.

Design: A retrospective audit of medication charts using the National Inpatient Medication Chart audit tool.

Method: 100 medication chart audits were conducted on patients presenting to the emergency department with a musculoskeletal injury who were managed by physiotherapy (n=50) or medical/nursing (n=50). The audits reviewed prescriber compliance with documentation requirements (e.g. patient identification, weight, adverse drug reactions), and any prescribing errors (e.g. unclear or incorrect prescribing or administration of individual medicine orders). Patient demographics and compliance for each audit item were compared between groups.

Results: No between group differences were detected in terms of patient age, gender, triage category and injured body region. A total of 212 drug orders were audited (physiotherapy n=92, medical/nursing n=120). Physiotherapists demonstrated higher completion rates for patient identification (48% vs 4%), patient weight (72% vs 12%) and medication history (78% vs 0%) compared to the medical/nursing group. Legibility of drug names and route of administration appeared equivalent, whereas physiotherapists had higher completion rates for legible drug doses (98% vs 84%) and prescriber name (100% vs 49%).

Conclusion: Physiotherapists trained in prescribing had favourable performance when audited on prescribing safety using the National Inpatient Medication Chart audit tool relative to existing emergency department prescribers.

Key Practice Points:

- Physiotherapists trained in prescribing perform with high levels of safety relative to existing emergency department prescribers when evaluated using the National Inpatient Medication Chart audit tool

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Non-medical prescribing has the potential to increase access to medicines, particularly in rural and remote areas, and is therefore likely to benefit the Aboriginal and Torres Strait Islander population and all Australians.

## AI, EVOLVING TECHNOLOGY & HUMAN EXPERIENCE

Nguyen J

Automation and Artificial Intelligence has been around for many years, but more recently the large leaps and bounds of the technology mean they are drastically affecting our businesses and digital lives. We're finding we need to transform in response to these evolving technologies. Everyone has heard about the oncoming threat of AI, but what about the opportunities? What does it allow us to gain?

## ASSESSING PSYCHOLOGICAL FACTORS FOR PSYCHOLOGICALLY INFORMED PRACTICE

Nicholas M<sup>1,2</sup>

<sup>1</sup>The University of Sydney, Sydney, Australia, <sup>2</sup>Royal North Shore Hospital, Sydney, Australia

The idea of identifying injured workers and motorists at risk of delayed recovery in order to prevent the development of chronic pain and associated disability has long been accepted as a desirable goal. Screening instruments for detecting modifiable psychological and social risk factors for delayed recovery have been promoted. But their value and practical applications are less well-established. A recurring question in the implementation of screening for psychological and social risk factors concerns what to do next. One review found that while physiotherapists could understand the importance of this screening most lacked the confidence to incorporate psychological and social interventions for the risk factors in their treatments. Three main approaches to managing people with recent musculoskeletal injuries have been promoted: the most traditional is stepped-care, but more recently stratified and matched care models have also been receiving attention. It is too early to draw firm conclusions about their relative merits, but this talk will describe each approach and the available evidence for them. Implications for training and implementation in routine clinical practice will also be addressed.

Key Practice Points:

As a result of this session, participants should:

- have a good understanding of how to use a brief screening instrument for identifying psychological risk factors for delayed recovery in injured patients
- have a good understanding of ways of helping patients to appreciate how psychological risk factors may be contributing to their musculoskeletal pain.
- be familiar with ways of incorporating the management of psychological risk factors in their clinical practice.

## PRACTICAL NEUROMUSCULAR ELECTRICAL STIMULATION OF SMALL ANIMALS

Nicholson H

Neuromuscular electrical stimulation (NMES) can be a valuable adjunct to physiotherapy treatment of small animals with conditions including a variety of neurological deficits and specific muscle weaknesses. Case studies will be used to illustrate considerations such as safety; the size and type of electrodes to use; machines that are the most “owner-friendly”; placement of electrodes; parameters; and dosage.

Key Practice Points:

- Attendees will leave with increased confidence in using neuromuscular electrical stimulation to assist in their treatment of dogs and cats.

## FIRST YEAR PHYSIOTHERAPY STUDENT EXPECTATIONS OF UNIVERSITY STUDY: A CROSS SECTIONAL SURVEY

Nicola K<sup>1</sup>, Mandrusiak A<sup>1</sup>

<sup>1</sup>*The University of Queensland, St Lucia, Australia*

**Aim:** To explore first year physiotherapy students’ perceived preparedness for university, their expectations of physiotherapy studies, and relationships between demographics and these perceptions.

**Design:** Cross-sectional survey.

**Method:** 108 first-year undergraduate students (63 females) completed the survey during their first semester of the physiotherapy program. Descriptive analyses of ratings of agreement were performed, as well as analyses to determine relationships between demographics and ratings.

**Results:** Most students (81.5%) felt prepared for university, but 39.2% did not feel supported in understanding differences between high school and university. Almost all (95.3%) felt somewhat or very confident in their knowledge of what a physiotherapist does, and 69 of the 70 who had received physiotherapy treatment had done so in private practice. Some reported being unaware that physiotherapy studies involve working with anatomy cadavers (29.9%), disrobing (23.4%), or touching other students (6.6%). Most (56.6%) expected written feedback on draft assignments before final submission. Only a few demographic variables were related to reported perceptions: for example, international students were significantly more likely to expect lecturers to prescribe specific homework ( $p = 0.01$ ) and to provide one-on-one feedback ( $p < 0.001$ ).

**Conclusion:** First year physiotherapy students are not always aware of the requirements for studying the program, and some expectations of university studies may not match actual practices.

Key Practice Points:

- Prospective and first year physiotherapy students should receive information regarding studying at university as well as about program-specific requirements to assist in their preparedness for their studies.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research is in higher education and is not specific to health outcomes of Aboriginal and Torres Strait Islander people.



## NAVIGATING THE NATIONAL DISABILITY INSURANCE SCHEME: HOW TO GUIDE AND SUPPORT THE PAEDIATRIC PATIENT

Nicola K<sup>1</sup>

<sup>1</sup>*School of Health, Medical and Applied Sciences, Central Queensland University, Rockhampton, Australia*

**Information/Background:** The National Disability Insurance Scheme provides funding for supports and services to Australians with permanent and significant disability. For many children, access to this funding will be the first time to receive support for their disability. Within the National Disability Insurance Scheme, there is the Early Childhood Early Intervention approach available to children under 7 years of age with a developmental delay or disability. It is important that physiotherapists are aware of the approach taken for children under 7 and can successfully complete reports and relevant forms.

**Aims/Objectives:** To improve participants' knowledge and understanding of the National Disability Insurance Scheme, Early Childhood Early Intervention in order to optimally guide paediatric patients and their families. Participants will be supported to enhance their knowledge and clinical application of recommendations and report writing to support patients to access the scheme, or for both planning and review meetings. In addition, participants will gain an understanding of how to successfully complete an assistive technology form, in order to achieve the best possible outcomes for their paediatric patient.

**Approach:** This presentation includes an introductory lecture covering relevant background information followed by an interactive case study session. Furthermore, participants will have the opportunity to explore an assistive technology application. Learning materials provided include handouts summarising the content covered.

**Key Practice Points:**

- Participants will gain a better understanding of the Early Childhood Early Intervention approach in order to guide the paediatric patient.
- Participants will learn how to clinically apply recommendations and successfully complete report writing, including assistive technology forms.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This presentation will be beneficial for those working with Aboriginal and Torres Strait Islander children and can be effectively applied to this population.

## MAKING SENSE OF SENSORY ASSESSMENT: HOW TO ASSESS SENSORY FUNCTIONING IN CHILDREN WITH LANGUAGE DISORDER

Nicola K<sup>1</sup>, Watter P<sup>1</sup>

<sup>1</sup>*The University of Queensland, St Lucia, Australia*

**Background:** Our work has found that sensory dysfunction is associated with poor motor performance in school-aged children with specific language impairment. Sensory assessments associated with motor performance included ocular-motor, vestibular, tactile, proprioception and motor planning. Administration of physiotherapy sensory assessments are warranted in paediatric physiotherapy to enhance clinical reasoning and management. Specific to this cohort of children, these assessments must be administered with an understanding of modifying typical communication to enhance the child's understanding and overall test validity.

**Aims/Objectives:** To improve participants' knowledge, skills and clinical reasoning in the clinical assessment of sensory functioning in children with language disorder. Participants will be guided to enhance their knowledge and clinical application of ocular-motor, vestibular, tactile, proprioception and motor planning

tests of school-aged children. In addition, participants will understand how to interpret these tests, in order to direct clinical reasoning and management.

**Approach:** This presentation includes an introductory lecture covering relevant background information followed by video stimulus material of assessments complemented by practical demonstration. Participants will have the opportunity to practice and gain feedback. Learning materials provided include a manual on how to perform these tests and strategies to enhance communication with children with language disorder.

**Key Practice Points:**

- Participants will understand and better apply sensory assessment to children with language disorder in clinical, educational and community settings
- Participants will understand the importance of these assessments and how performance on these tests guide clinical reasoning and management

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This presentation outlines best practice for children with language impairment. It isn't specific for Aboriginal and Torres Strait Islander people but may be applied to this population.

## DO PATIENTS DISCHARGED FROM THE PHYSIOTHERAPY-LED PELVIC HEALTH CLINIC RE-PRESENT?

Nucifora J<sup>1</sup>, Howard Z<sup>1</sup>, Weir K<sup>1</sup>

<sup>1</sup>*Gold Coast University Hospital and Health Service, Southport, Australia*

**Aim:** Physiotherapy-led pelvic health clinics (PLPHC) are increasingly utilized in Australia. This model of care has demonstrated improvements for patient access to care and management of specialist outpatient waiting lists, however no studies have investigated patient re-presentation rates. This study aimed to determine the reasons for, and re-referral rate of patients previously managed and discharged from the PLPHC at Gold Coast Hospital and Health Service (GCHHS).

**Design:** Retrospective clinical audit.

**Method:** Patients discharged from GCHHS PLPHC without urogynaecology medical specialist review in 2017 were identified and checked for re-referral to gynaecology, gynaecology, urology, and colorectal outpatient services in 2018. Two investigators independently reviewed patient medical records to determine reason for re-referral.

**Results:** 209 patients were discharged from the PLPHC in 2017, with 65% of these (n=144) being discharged without requiring urogynaecology medical specialist review. Twenty of the 144 patients re-presented to specialist medical outpatient services in 2018, with ten of these (<7%) for the same condition previously managed by the PLPHC. Of the 10 re-referrals, one required further physiotherapy conservative management, one failed to attend their medical appointment, and the remainder (n=8) were existing patients with ongoing vaginal pessary care in the public health care system.

**Conclusion:** This clinical audit demonstrated low re-referral rates of patients discharged from the PLPHC without requiring urogynaecology speciality management within 12 months of discharge.

**Key Practice Points:**

- This study supports the effectiveness of PLPHCs in improving patient access and quality of care, and managing demand for specialty outpatient services.

- 5-year re-presentation data would be of future value.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:  
Not applicable.

The project was approved by the GCHHS Human Research and Ethics Committee (HREC) Approval no. HREC/17/QCG/129.

## IMPROVING SERVICES FOR PATIENTS IN DISORDERS OF CONSCIOUSNESS: IMPLEMENTATION OF FAMILY AND STAFF EDUCATION PACKAGES IN A NEUROSCIENCES UNIT

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<sup>1</sup>Princess Alexandra Hospital, Woolloongabba, Australia

Aim: To evaluate the effectiveness of a family and staff education package in enhancing knowledge, confidence/skills of staff and families surrounding disorders of consciousness and sensory stimulation in an acute neurosciences hospital unit.

Design: Pre-post intervention study.

Method: The brain injury-specific education package consists of a sensory preference questionnaire, sensory stimulation plan, and a disorder of consciousness management plan. Pre- and post-intervention surveys measuring family member and staff perceptions of the family-specific and staff-specific education, respectively, were collected with numerical rating scales (1 to 10).

Results: Between June 2018 – April 2019, 14 family members and 54 staff (nurses n= 40, allied health n= 14) were recruited. Preliminary data from family members suggests they felt the sensory stimulation plan was particularly useful. Of the n=24 staff members who have completed pre- and post-surveys, a significant increase in knowledge of disorders of consciousness and awareness of sensory stimulation plans (mean (SD) score pre 3.7 (2.5) to post 8.1 (1.4); p<0.001) was identified.

Conclusion:

A newly developed family and staff education package has the potential to enhance family and staff knowledge, confidence and skills surrounding management of patients with disorders of consciousness.

Key Practice Points:

- This project has identified a previously unmet need for education of family and staff regarding disorders of consciousness and sensory stimulation.
- Physiotherapists are well-placed to deliver early education regarding disorders of consciousness to family members and staff as a part of client-centred care

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:  
The incidence of brain injury in Aboriginal and Torres Strait Islander communities is significantly higher than the general Australian population; therefore interventions that facilitate treatment of disorders of consciousness are likely to have a positive effect on health outcomes for Aboriginal and Torres Strait Islander patients and their families.

## A PARTICIPATIVE HAZARD IDENTIFICATION AND RISK MANAGEMENT (APHIRM) TOOLKIT: USING EVIDENCE TO REDUCE MUSCULOSKELETAL DISORDERS

Oakman J<sup>1</sup>

<sup>1</sup>*La Trobe University, Melbourne, Australia*

Musculoskeletal disorders (MSDs) are the largest Occupational Health and Safety (OHS) problem in many countries, including Australia where their annual total costs are calculated to be over \$24 billion. With our ageing population and increasing need for higher retirement ages, there is an urgent need for workplaces to implement evidence-based practices that will reduce MSD risk more effectively. There is now robust evidence from a large body of peer-reviewed research over the past four decades, including both epidemiological and intervention studies, that a diverse range of work-related psychosocial hazards affect MSD risk. In addition, MSD risk management is more effective when it entails input from workers that is high levels of participation. However, this evidence is not translated into current workplace risk management practices.

This presentation will outline key evidence to practice gaps in the current approaches to the risk management of MSDs. A review of the current research on MSD aetiology will be provided along with insights from a range of projects based in Australian workplaces which have underpinned the development of APHIRM (A Participative Hazard identification and Risk Management) toolkit to address these important gaps. APHIRM is based on principles of implementation science and uses a WHO (World Health Organisation) model of toolkits to maximise sustainability. APHIRM is designed for workplace practitioners to implement in their own organisations to reduce the burden of MSDs.

### Key Practice Points

- Update on contemporary evidence on the aetiology of musculoskeletal disorders
- Identification of key barriers to implementation of new workplace methods
- Introduction of APHIRM toolkit design to address the gaps in currently available risk management tools for MSDs.

## AN MS AQUATIC JOURNEY – FROM FEAR TO FREEDOM

O'Connell L<sup>1,2,3</sup>

<sup>1</sup>*Unley Physiotherapy, Unley, Australia,* <sup>2</sup>*MS Society, Adelaide, Australia,* <sup>3</sup>*Modbury Hospital, Modbury, Australia*

The MS Society of SA and NT has a long history of including aquatic physiotherapy in its services to clients. With the introduction of the NDIS clients have been facilitated to access both MS Society and privately run aquatic therapy sessions. MS clients have therefore had increased opportunity to experience the beneficial effects of aquatic therapy. In particular, significantly disabled clients have not only improved their physical function but have gained increased water confidence, some moving from initial fear of the aquatic environment to having the confidence and swimming ability to participate as a member of TEAM MS, in the MS Society's annual fundraiser – The MS 24 Hr Mighty Swim.

This session will highlight the aquatic experiences that have enabled this transformation from “Fear to Freedom” to take place.

### Key Practice Points:

- Aquatic physiotherapy can be used to improve the health and wellbeing of people with a disability
- There are multiple aquatic physiotherapy treatment options that can be utilised to achieve functional and health and wellbeing goals for people with a disability

- Aquatic physiotherapy can be effective at achieving the goals of people with high and low levels of physical function

## SAFETY AND EFFICACY OF ONE-WAY SPEAKING VALVES

**O'Connor L<sup>1,2</sup>**, Morris N<sup>3,4</sup>, Paratz J<sup>2</sup>

<sup>1</sup>Gold Coast University Hospital, Southport, Australia, <sup>2</sup>Griffith University, Southport, Australia, <sup>3</sup>School of Allied Health Sciences and Menzies Health Institute, Griffith University, Southport, Australia, <sup>4</sup>Metro North Hospital and Health Service, The Prince Charles Hospital. Allied Health Research Collaborative, Brisbane, Australia

**Aim:** To examine cardiorespiratory parameters following the application of one-way speaking valves, specifically regarding safety and efficacy

**Design:** A prospective observational study

**Method:** This study involved observing cardiorespiratory parameters (heart rate, respiratory rate, peripheral oxygen saturations, arterial oxygen, arterial carbon dioxide and blood pressure) in 20 participants from a neuro-trauma ICU, who tolerated using a one-way speaking valve for periods longer than 120-minutes. Adverse events were defined a-priori.

**Results:** Data was collected on 19 patients. The mean age of participants was 50.3 years (range 18-78), with a mean APACHE II of 26.37. The mean time of one-way speaking valve use was 9.0 hours (range 2-17 hours). In the majority of participants (N=15), the valve was only removed at night when the participants were sleeping. During the 120-minute period of data collection, two patients experienced increased blood pressure, but not significant enough to necessitate the removal of the valve. There were no differences in any other cardiorespiratory parameters, and no adverse events.

**Conclusion:** This is the first study to observe safety and efficacy with extended use of one-way valves. The results from this study indicate that one-way speaking valves could be incorporated safely into daily patient cares for extended use.

**Key Practice Points:**

- There were no adverse events with extended use of one-way speaking valve
- Extended use of one-way speaking valves may provide other benefits in addition to communication for patients in ICU, including increased ability to participate in cares, improved mood, and quality of life

## ATTRIBUTES OF CLINICIANS THAT FOSTER PATIENT UPTAKE OF RECOMMENDED HEALTH SERVICES AND MANAGEMENT STRATEGIES FOR MUSCULOSKELETAL DISORDERS

**O'Leary S<sup>1,2</sup>**, Gale J<sup>3</sup>, Kuipers P<sup>4</sup>, Dalton M<sup>5</sup>, Volker G<sup>2</sup>, Thackeray J<sup>1</sup>, McPhail S<sup>6</sup>

<sup>1</sup>University of Queensland, Brisbane, Australia, <sup>2</sup>Royal Brisbane and Womens Hospital, Brisbane, Australia, <sup>3</sup>HealthChange Australia, Kangaroo Valley, Australia, <sup>4</sup>Centre for Functioning and Health Research, Brisbane, Australia, <sup>5</sup>Australian Catholic University, Brisbane, Australia, <sup>6</sup>Queensland University of Technology, Brisbane,

**Aim:** To firstly identify attributes required of clinicians to foster optimal uptake of recommended health services and management strategies by patients with musculoskeletal conditions. Secondly, to determine how important clinicians perceive these attributes to be for optimising patient uptake, and to determine their current perceived level of knowledge and skill in each of these attributes.

**Design:** Delphi process and survey.

Method: A 3 round Delphi process was undertaken consisting of a panel of sixteen health professionals from multiple disciplines and appointments. Findings formed an online survey distributed to clinicians managing musculoskeletal conditions in both public and private sectors. Survey data were analysed using Spearman's Correlational Coefficients and Mann-Whitney U Tests.

Results: The Delphi panel reached consensus on 12 attributes. 512 physiotherapists completed the survey. All attributes were rated highly important (median range 7-10 on a 10 point scale). Clinicians' ratings of attribute importance significantly, but not strongly, correlated with their perceived level of theoretical knowledge ( $\rho$  rho range = 0.24 to 0.52) and practical skill ( $\rho$  rho range = 0.25 - 0.51) relevant to the attribute.

Conclusion: Clinicians recognise their capacity to optimise patient uptake is influenced by various clinical attributes. Their perceived importance of specific attributes does not necessarily reflect their perceived level of knowledge and skill specific to that attribute.

Key Practice Points:

- Various clinician attributes influence patient uptake of recommended health services/strategies.
- Enhancing training of these clinician attributes may improve clinical outcomes.
- Education providers need to recognise this area of clinical expertise as a specific skill set.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Improving a clinician's knowledge and skills in relationship to attributes concerning 'social and cultural diversity' will potentially improve health outcomes for Aboriginal and Torres Strait Islander people.

## INNOVATION IS A STATE OF MIND

O'Loughlin J

No matter how well we are doing things today, if we keep doing them the same in way, in a few years' time we will have been left behind. The increasingly rapid pace of change can quickly turn today's cutting edge best practice into tomorrow's fax machine. To stay relevant and successful, businesses need to innovate. But how do you do it? In eight years hosting ABC TV's The New Inventors, James O'Loughlin worked with over a thousand innovators who thought outside the box and came up with new and better ways of doing things.

In his keynote presentation James will discuss:

- Why every business needs to be continually innovating.
- The three things innovators do better than everyone else.
- How innovation happens... James will share a process that enables everyone to come up with more innovative ideas.
- The six things every business can do to build an innovative corporate culture.

Take home messages:

- Simple strategies to use to be more innovative
- A process to go through to come up with new ideas
- An understanding of how to grow ideas to the point they can be implemented

## PROPERTIES OF A NOVEL TOOL TO TEST AND TRAIN TACTILE ACUITY

Olthof N<sup>1</sup>, Harvie D<sup>1,3</sup>, Moseley L<sup>3</sup>, Sterling M<sup>2</sup>, Coppieters M<sup>1</sup>

<sup>1</sup>The Hopkins Centre, Menzies Health Institute QLD, Griffith University, Southport, Australia, <sup>2</sup>University of Queensland, Brisbane, Australia, <sup>3</sup>University of South Australia, Adelaide, Australia

**Background:** Measuring tactile acuity in people with persistent pain may be relevant due to its apparent relationship with symptoms. However, current clinical tools show limitations in psychometric properties. A novel tactile testing device (TTD) was developed to overcome these limitations and create opportunities for tactile training.

**Design:** Test-retest and cross-sectional between group comparisons were employed to examine test properties.

**Method:** In an initial study, 50 healthy controls underwent test-retest assessments to evaluate intra-rater reliability (ICC 2.1), internal consistency (ICC 2.4) and agreement (SEM) of three tests of tactile acuity using the TTD. In a subsequent study, TTD scores were compared among 30 healthy individuals and 30 people with neck pain, in order to assess examine test construct validity.

**Results:** The ICC 2.1 and ICC 2.4 were 0.60 and 0.78 for the localization test, 0.66 and 0.77 for the orientation test and 0.73 and 0.84 for overall tactile acuity. No fixed or proportional bias was present, and SEMs ranged from 6-9%. Men with neck pain scored significantly lower overall tactile acuity, while no \group difference were found for women.

**Discussion:** The TTD demonstrated comparable properties to current clinical tests of tactile acuity, such as the two-point discrimination threshold. Further development of the TTD is needed to justify clinical use. Parallel research investigating its potential as a tactile training tool also supports

**Key Practise points:**

- Tactile acuity tests are thought to be a clinical marker of somatosensory dysfunction in persistent pain.
- The TTD performs similarly to current clinical tools measuring tactile acuity.
- Further development is needed to justify clinical use of the TTD, however with further development, the TTD offers potential as a practical means for physiotherapists to test and train tactile acuity.

## TRANSLATING PHYSIOTHERAPY PRACTICES IN HIGH PERFORMANCE TENNIS TO ALL TENNIS PARTICIPANTS

Omizzolo M<sup>1</sup>

<sup>1</sup>Tennis Australia, Richmond, Australia

**Background:** Tennis is one of the top 10 most participated sports in Australia and provides opportunities for Australians of all ages and physical abilities to be active. Physiotherapists can play a vital role in ensuring Australians are participating in sport and exercise. Tennis Australia (TA) is committed to achieving healthier communities through more active players in the sport. The Physiotherapy team in TA's performance unit provide services for junior to professional athletes. Having a better understanding of current injury trends in elite junior and professional Tennis may enhance Physiotherapists' ability to connect with Tennis Players in the community.

**Aims/objectives:** To improve participants' understanding of common Tennis injuries and return to play considerations after injury. Injury prevention strategies in Tennis, including load management measures and



equipment choices for Tennis players will be described. Bone stress injury in adolescent Tennis players will be presented as an example of current injury management practices.

**Approach:** The presenter will provide an interactive lecture-style presentation, including photos and short videos.

**Key Practice Points:** It is expected that on completion of this session, participants will be able to:

- Recognise injuries that are unique or more common in Tennis, including Distal Humeral Bone Stress and Lumbar Pars Stress;
- Provide their patients with Tennis-specific advice on return to play from injury;
- Educate Tennis players on Tennis-specific injury prevention strategies.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples:** While this session is not specific for Aboriginal and Torres Strait Islander people, Tennis Australia is committed to increasing accessibility to Tennis for Aboriginal and Torres Strait Islander peoples, by promoting better health through exercise and pathway opportunities for talented young athletes.

## **PATIENTS AND CAREGIVERS ARE SATISFIED WITH TELEHEALTH IN MANAGING THEIR HEALTH: FINDINGS FROM A SYSTEMATIC REVIEW.**

**Orlando J<sup>1</sup>**, Beard M<sup>1</sup>, Kumar S<sup>2</sup>

<sup>1</sup>Royal Adelaide Hospital, Adelaide, Australia, <sup>2</sup>University of South Australia, Adelaide, Australia

**Aim:** To examine whether patients and their caregivers living in rural and remote areas are satisfied with telehealth in managing their health.

**Design:** A systematic review of quantitative and qualitative studies.

**Method:** A systematic search of six electronic databases was conducted and reported in line with PRISMA statement. Studies of people living in rural and remote areas who attended an outpatient consultation for any health condition via videoconference were included if the studies measured patient and/or caregivers' satisfaction with telehealth. A critical appraisal tool was used to evaluate the methodological quality of included studies. Data on satisfaction were extracted and descriptively synthesised.

**Results:** Thirty-six studies of varying study designs and methodological quality met the inclusion criteria. The outcomes of satisfaction with telehealth were categorised into four dimensions: system quality, information quality, service quality and overall satisfaction. There were high levels of satisfaction across all dimensions but there was a great deal of heterogeneity in how satisfaction was defined and measured.

**Conclusion:** People living in rural and remote areas are satisfied with telehealth as a mode of service delivery, across a range of health conditions, as it may improve access to health care and avoid the inconvenience of travel.

**Key Practice Points:**

- Telehealth may be a viable alternate model of care, including physiotherapy, for people living in rural and remote areas;
- Satisfaction with telehealth is multi-dimensional as it is influenced by system, information and service quality;
- Technological advancements in telehealth should be complemented by a competent and experienced practitioner.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Studies from this review specifically addressed Aboriginal and Torres Strait Islander people living in rural and remote areas and demonstrated satisfaction with telehealth by supporting people in their local communities.

## THE RELATIONSHIP BETWEEN STRENGTH MEASURES AND TASK PERFORMANCE IN SPECIALIST POLICE

Orr R<sup>1</sup>, Robinson J<sup>3</sup>, Hasanki K<sup>2</sup>, Talaber K<sup>2</sup>, Schram B<sup>1</sup>

<sup>1</sup>Tactical Research Unit, Bond University, Robina, Australia, <sup>2</sup>Australian Federal Police, Canberra, Australia,

<sup>3</sup>Physiotherapy Program, Robina, Australia

**Aim:** To determine the relationships between strength measures (absolute and relative) and occupational task performance in specialist police officers.

**Design:** A retrospective cohort study.

**Method:** Data were provided for 47 male specialist police officers from an elite Australian police unit. Data included body weight (mean = 89.0 ± 8.58kg), strength measures (1 Repetition Maximum [RM] measures for a bench press, squat, deadlift and pull-up) and task performance measures (85 kg Victim Drag wearing 15 kg of operational load and a 5 km Pack March wearing 40 kg of operational load). Relative strength measures were determined by dividing 1RM results with the officer's bodyweight with the result provided as a ratio.

**Results:** Significant, moderate to strong correlations were found between all strength measures and victim drag performance and significant negative moderate correlations were found between relative bench, absolute and relative squat and absolute and relative pushup and pack march times. The absolute deadlift was the strongest correlation to the victim drag ( $r = 0.747$ ,  $p < 0.01$ ) while the relative pull-up showed the strongest correlation with pack march performance ( $r = -0.466$ ,  $p < 0.01$ ).

**Conclusion:** Significant associations exist between both absolute and relative strength measures and task performance in elite specialist police populations. The strength of these relationships may vary with different tasks.

**Key Practice Points:**

- Improvements in absolute and relative upper and lower body strength may improve task performance in this population.
- Both absolute and relative strength development are essential for successful return-to-work and work hardening programs.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research will improve the health outcomes of Aboriginal and Torres Strait Islander people who serve in elite police forces.

## FIREFIGHTERS AND THEIR OCCUPATIONAL LOADS

Dawes J<sup>2</sup>, Orr R<sup>1</sup>, Goatcher J<sup>3</sup>, Lockie R<sup>4</sup>

<sup>1</sup>Tactical Research Unit, Bond University, Robina, Australia, <sup>2</sup>Oklahoma State University, Stillwater, United States of America, <sup>3</sup>United States Air Force Academy, , United States of America, <sup>4</sup>California State Fullerton University, , United States of America

**Aim:** To investigate the occupational loads carried by firefighters when attending a structural fire.

Design: An observational study.

Methods: Data from 95 male firefighters (mean age=39.33±9.77 years: height=177.43±6.34cm: weight=89.14±13.12kg, BMI=28.27±3.60 kg/m<sup>2</sup>) attending fire ground training were collected. Officers were required to complete live fire training and were dressed in the Personal Protective Equipment associated with their role. Data were divided into four sub groups based on firefighter roles, being: driver (n=18), line firefighter (n=48), officer (n=13), and paramedic (n=16). An ANOVA (alpha p<.01) was used to investigate differences in absolute load and relative load (load/bodyweight\*100) between roles.

Results: There were no significant differences in height, weight or BMI between groups. The mean absolute loads carried by the subgroups were similar across all groups, ranging from 27.00 ± 2.01 kg (drivers) to 28.02 ± 2.177 kg (paramedics). Relative loads were likewise similar ranging from 30.40 ± 4.58 % bodyweight (officers) to 32.57 ± 4.99 % bodyweight (line firefighters).

Conclusion: Regardless of role within a firefighting station, firefighters carry similar absolute and relative loads. These intermittent loads are notably heavier than the chronic loads carried by law enforcement (approx. 10 kg) and lighter than the sporadic--hronic loads carried by Army personnel (approx. 45+kg).

Key Practice Points:

- There is a requirement for firefighters to carry heavy loads that are similar regardless of job role.
- Firefighters must be reconditioned to carry loads of around 28 kg or 30% of their body weight to return to full duties following injuries.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research will improve the health outcomes of Aboriginal and Torres Strait Islander people who serve as firefighters.

## ASSOCIATIONS BETWEEN FITNESS MEASURES AND CHANGE OF DIRECTION SPEED WITH AND WITHOUT OCCUPATIONAL LOADS IN FEMALE POLICE OFFICERS

Orr R<sup>1</sup>, Kukić F<sup>2</sup>, Koropanovski N<sup>3</sup>, Jankovic R, Cvorovic A<sup>3</sup>, Dawes J<sup>4</sup>, Lockie R<sup>5</sup>

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<sup>3</sup>University of Criminal Investigation and Police Studies, , Serbia, <sup>4</sup>Oklahoma State University, Stillwater, United States of America, <sup>5</sup>California State Fullerton University, Fullerton, United States of America

Aim: To determine relationships between fitness measures and change of direction speed in female police officers with and without occupational loads.

Design: A retrospective cohort study.

Method: Retrospective data were provided for 27 female police officers (age=32.19±5.09 yrs: height=162.78±5.01 cm: mass=71.31±13.42 kg) and included fitness measures of: power (standing long jump [SLJ]), muscle endurance (push-ups [PU], sit-ups [SU]), aerobic capacity (est. VO<sub>2</sub>max), and change of direction speed (CODS; Illinois agility test). The CODS test was performed without and with occupational load (10 kg load). Paired samples t-tests (between-load conditions) and Pearson's correlations (relationships between measures) were performed.

Results: CODS was significantly slower when loaded (unloaded=~23.17s: loaded=~24.14s, p<.001) with a strong, significant relationship between load conditions (r=.956, p<.001). Moderate-to-strong, significant

relationships were found between all fitness measures ranging from VO2max ( $r = -.448$ ) to SU ( $r = -.673$ ) in the unloaded condition, with the strength of these relationships increasing in the loaded condition.

Conclusion: While unloaded agility performance was strongly associated with loaded performance, female police officer CODS was significantly reduced when carrying occupational loads. A variety of fitness measures that influence officer CODS performance become of increasing importance when occupational loads are carried.

Key Practice Points:

- Unloaded CODS performance (as measured by the Illinois agility test) can be used to gauge readiness to perform loaded CODS.
- Lower-body power and trunk endurance become increasingly important when female police officers carry occupational loads, and must be considered when including occupational loads as part of return-to-work programming.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population above that of the non-Indigenous population

## RELATIONSHIPS BETWEEN A PHYSICAL FITNESS ASSESSMENT MEASURES AND A TASK-SPECIFIC PHYSICAL ASSESSMENT

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Aim: The aim of this study was to investigate relationships between a physical fitness assessment measures and a task-specific physical assessment.

Design: A retrospective cohort study.

Method: Data for 208 male (age:  $26.60 \pm 5.66$  yrs; height:  $179.22 \pm 10.49$  cm; body mass  $83.97 \pm 14.02$  kg) and 99 female (age:  $26.87 \pm 6.62$  yrs; height:  $168.13 \pm 6.46$  cm; body mass  $65.42 \pm 8.60$  kg) police trainees who completed the Physical Appraisal Test (PAT) and the task-specific Physical Competency Test (PCT) were provided. The PAT comprised a 2.4km run, vertical jump, 60s push-ups, and grip strength measures. The PCT consisted of ten occupational-specific tasks completed as a 400m obstacle course.

Results: All PAT measures were significantly correlated to PCT performance with the strength of the correlations ranging from strong (2.4km run time;  $r = .639$ ,  $p < 0.01$ ) to moderate (vertical jump height;  $r = -.420$ ,  $p < 0.01$ ). The highest predictive relationship was seen with the 2.4km run ( $r^2 = .409$ ), and the lowest with standing vertical jump ( $r^2 = .177$ ).

Conclusion: Aerobic endurance, lower-body muscle power, grip strength and upper-body muscle endurance are measures associated with, and predictive of, PCT performance; an assessment designed to mimic police task requirements.

Key Practice Points:

- Loss of aerobic endurance, lower-body muscle power, grip strength and upper-body muscle endurance due to injury may impact on police task performance and place the officer and members of the public at risk.

- Return-to-work reconditioning/conditioning programs for both police trainees and officers should include these measures to optimize occupational performance.
- A 2.4km run in particular could be used as an outcome measure as part of return-to-work planning.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population above that of the non-Indigenous population

## DIFFERENCES IN HEART RATES BETWEEN GENERAL OFFICERS AND INSTRUCTORS EMPLOYING DEFENSIVE TACTICS SKILLS

**Orr R<sup>1,2</sup>**, Pearson C<sup>1</sup>, Schram B<sup>1,2</sup>, Lockie R<sup>3</sup>, Holmes R<sup>4</sup>, Kornhauser C<sup>4</sup>, Dawes J<sup>5</sup>

<sup>1</sup>Physiotherapy Program, Bond University, Gold Coast, Australia, <sup>2</sup>Tactical Research Unit, Bond University, Gold Coast, Australia, <sup>3</sup>California State Fullerton University, , United States of America, <sup>4</sup>Colorado State Patrol, Colorado Springs, United States of America, <sup>5</sup>Oklahoma State University, Stillwater, United States of America

**Aim:** To compare heart rate responses during a defensive tactics skills between expert and general duties police officers.

**Design:** Retrospective cohort study.

**Method:** Heart rate (HR) data (mean, peak, and peak HR percentage, measured by Polar FT7) of police officers completing a defensive tactics (DEFTAC) gauntlet were provided. Participants were: 24 police instructors (age = 32.13±6.72yrs, height = 178.30±60cm, body mass = 92.40±16.30kg) and 37 general duties officers (age = 39.20±8.40 years, height = 179.50±7.70cm, body mass = 89.70±14.1kg). Independent samples t-tests (instructors and officers) and an ANOVA (instructors, officers who passed, officers who failed) were performed.

**Results:** There were no significant differences in HR measures between the instructors (HR: mean = 154.50±21.27bpm; peak = 179.50±13.81bpm, peak% = 96.70±5.16%) and the general duties police officers (Passed n=23, HR: mean = 155.82±18.77bpm; peak = 180.30±8.88bpm, peak% = 98.57±7.28%; Failed n = 11, HR: mean = 160.81±14.02bpm; peak = 177.00±11.58bpm, peak% = 99.82±5.74%) the DEFTAC drill. Nonetheless, the officers who failed DEFTAC worked at the highest percentage of peak HR.

**Conclusion:** All participants, regardless of skill, exhibited a maximal HR response when engaged in defensive tactics skills. With cardiovascular disease risk being higher in police officers than the general population, maintaining heart health is of importance to all officers, regardless of their time in service.

**Key Practical Points:**

- All officers could experience high HR stress during job duties involving defensive tactics.
- General heart health optimisation strategies (general health, fitness and stress management) should form part of any return-to-work program for officers.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population above that of the non-Indigenous population.

## CARDIORESPIRATORY PHYSIOTHERAPY RESEARCH AND PRACTICE OVERSEAS, IS IT WORTH IT?

Osadnik C

Be prepared to be inspired. This interactive panel session will showcase the cardiorespiratory keynote and invited speakers beyond the cutting-edge research that they are presenting elsewhere on the program. Attendees will have the opportunity to ask questions and drive the discussion. A post-doctoral research fellowship saw Dr Christian Osadnik travel overseas to Belgium where he was effective in fostering a collaborative research partnership. Come and hear his reflections on the experience (was it worth it?) and how this unique opportunity has continued to shape his professional contributions.

## PERSONALISING REHABILITATION IN ADULT CHRONIC RESPIRATORY DISEASE

Osadnik C

<sup>1</sup>Monash University, Department of Physiotherapy, Melbourne, Australia, <sup>2</sup>Monash Health, Monash Lung and Sleep, Melbourne, Australia

This session will focus on the physiotherapy assessment and rehabilitation of adults with chronic respiratory disease (predominantly chronic obstructive pulmonary disease). It will explore the ways in which comprehensive physiotherapy evaluation may be used to assist with targeted patient selection and tailored rehabilitation strategies. This will be discussed with particular reference to identifying 'treatable traits' such as skeletal muscle dysfunction and frailty during the acute and/or stable disease state. This evidence-based session will offer clinicians insight into some novel and emerging strategies being investigated in an attempt to optimise pulmonary rehabilitation outcomes in these patients. It is hoped that attendees will gain an appreciation for the exciting and evolving landscape currently on offer within adult respiratory medicine and rehabilitation.

### Key Practice Points:

- Pulmonary rehabilitation improves many clinically important outcomes, on average, however one-size-fits-all models do not maximise benefits for all patients.
- 'Treatable traits' can be detected via comprehensive evaluation of patients with chronic respiratory disease, and physiotherapists in respiratory medicine may play a crucial role in its future implementation into clinical care.
- Patients at increased risk of functional decline after acute respiratory exacerbation are identifiable and may warrant more targeted care after discharge.

## IMPLEMENTATION OF A PARTICIPATIVE HAZARD IDENTIFICATION AND RISK MANAGEMENT TOOLKIT: A PILOT STUDY IN MINING

Otto B<sup>1</sup>, Oakman J<sup>2</sup>

<sup>1</sup>Not disclosed, Tenerife, Australia, <sup>2</sup>La Trobe University, Melbourne, Australia

**Aim:** To implement A Participative Hazard Identification and Risk Management Toolkit to reduce work related musculoskeletal disorders in mining employees.

**Design:** La Trobe University researchers have developed a participative toolkit in accordance with World Health Organisation guidelines. The toolkit is based on contemporary evidence on aetiology of work related musculoskeletal disorders and assists workplaces to identify and then manage psychosocial and physical hazards using a participative approach to develop and implement risk controls.

Method: Fifty mining employees participated in a survey and focus groups to identify hazards associated with WMSD risk and then develop risk controls.

Results: Examples of hazards identified include lack of promotion opportunities, lack of feedback on performance, lack of role clarity, senior management attitudes, lack of learning opportunities, sustained postures and very repetitive actions. Focus groups identified key issues and suggested risk controls which were developed into an action plan.

Conclusion: Implementation of the toolkit is a new approach in the organisation to risk management of work related musculoskeletal disorders. The action plan developed as part of the pilot is in the first stages of implementation and early feedback is positive. A second survey will be done 12 months following implementation of the action plan.

Key Practice Points:

- Work related musculoskeletal disorders are complex and associated with exposure to a broad range of physical and psychosocial hazards
- Worker participation in all stages of risk management of musculoskeletal disorders is critical
- Management support is a key component to ensure appropriate resources to facilitate necessary changes.

## 'TIGHTENING UP' HYPERMOBILITY IN PAEDIATRICS

Pacey V<sup>1,2</sup>

<sup>1</sup>Department of Health Professions, Macquarie University, Sydney, Australia, <sup>2</sup>Children's Hospital at Westmead Clinical School, The University of Sydney, Sydney, Australia

The term Generalised Hypermobility Spectrum Disorder was coined in 2017 to describe individuals with generalised joint hypermobility and symptoms such as chronic pain and multisystemic complaints, who did not meet the new and more stringent diagnostic criteria for hypermobile Ehlers-Danlos Syndrome. The applicability of these diagnoses and criteria in children was not thoroughly considered or tested. Since this time, a greater understanding of the impact and evolution of hypermobility disorders in the paediatric population has grown from both an emerging evidence base and expert international opinion. Evolution and resolution of joint hypermobility and multisystemic complaints over the paediatric years is now better understood, and comprehensive standardised assessment beyond just the Beighton score is best practice. The relationship of complex multisystem complaints with hypermobility disorders remains unclear, yet their significant effect on a child's prognosis, function and quality of life has been clearly demonstrated. Physiotherapy and multidisciplinary interventions effectively reduce children's pain in both the short and long term however improvements in function and quality of life following treatment have not been well established. Recent research demonstrates that children with hypermobility disorders will receive similar benefits from interventions to that of children with other complex pain conditions, providing increased options for service provision to this patient group. The increased knowledge specific to paediatric hypermobility disorders is creating greater clarity in diagnosis, assessment and management for children with hypermobility disorders.

Key Practice Points:

- Comprehensive assessment and strict definitions of generalised hypermobility in children is required.
- Multisystemic complaints of children with hypermobility disorders are indicators of poor function and quality of life over the paediatric years.
- Multiple physiotherapy and multidisciplinary management strategies will improve pain complaints of children with hypermobility disorders.



## WALKING ENDURANCE AND GAIT STRATEGIES OF CHILDREN WITH HEALED PERTHES DISEASE

Jamil K<sup>3,4</sup>, Li J<sup>1</sup>, Bucknell M<sup>1</sup>, Fuller J<sup>1</sup>, McKay M<sup>4</sup>, Baldwin J<sup>4</sup>, Burns J<sup>4</sup>, Munns C<sup>1,2,4</sup>, **Pacey V<sup>1,4</sup>**

<sup>1</sup>Macquarie University, North Ryde, Australia, <sup>2</sup>The Children's Hospital at Westmead, Westmead, Australia, <sup>3</sup>Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia, <sup>4</sup>The University of Sydney, Sydney, Australia

**Aim:** To assess the walking endurance, fatigability and gait changes of children with healed Perthes disease.

**Design:** Cross sectional study

**Method:** Fifty-one children (38 males) aged 8 - 16 years >3 years post-diagnosis of Perthes Disease were recruited via tertiary orthopaedic clinics. Normative data was extracted from the 1000 Norms Project dataset including 152 similarly aged children (76 males). Walking endurance was assessed with the six minute walk test with temporo-spatial gait parameters recorded throughout by the GAITRite system.

**Results:** In comparison to healthy peers, children with healed Perthes disease demonstrated significantly reduced walking endurance (Six minute walk test mean difference 181.2m, 95% CI 152.4 – 210, p<0.01). No fatiguability was seen during the testing with no significant difference observed between the cumulative distance of the first three and last three minutes (mean difference 1.94m, 95% CI -12.6 – 16.48m), p=0.49). Children with unilateral disease (n=43) walked significantly faster (mean difference 0.14m/sec, 95% CI 0.07 – 0.21m/sec, p<0.01) with a higher cadence (mean difference 9.3 steps/min, 95% CI 1.1 – 17.4 steps/min, p<0.01) compared to children with bilateral disease (n=8).

**Conclusion:** Children with Perthes disease have reduced overall walking endurance in comparison to healthy peers, without demonstrating fatiguability over six minutes. Children with bilateral and unilateral disease demonstrated altered gait strategies.

**Key Practice Points:**

- Walking endurance and quality should be considered in the long term outcome assessment of children with Perthes disease.
- Children with bilateral healed Perthes disease demonstrate ongoing gait alterations three years post diagnosis.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples:** The results of this research are not expected to impact on the health outcomes of Aboriginal and Torres Strait Islander children any greater than non-Indigenous children.

## INNOVATIVE HEALTH PROFESSIONAL PARTNERSHIPS IN PRIMARY CARE FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE

**Pagano L<sup>1</sup>**, McKeough Z<sup>1</sup>, Wootton S<sup>1,2</sup>, Chan A<sup>2,3,4</sup>, Mahadev S<sup>2,4</sup>, Crone S<sup>2</sup>, Zwar N<sup>5</sup>, Dennis S<sup>1</sup>

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**Aim:** To evaluate whether an integrated General Practitioner (GP)-physiotherapist partnership model of care improves the identification of chronic obstructive pulmonary disease (COPD) in primary care.

**Design:** Preliminary data from a prospective feasibility study.

Method: General practices were selected from a Primary Health Network. Cardiorespiratory physiotherapists were placed at each practice. “At risk” participants (aged >40 years, current/ex-smoker) and people with previously diagnosed COPD were identified from a practice database and invited to participate. At the assessment, the physiotherapist performed pre and post-bronchodilator spirometry to identify COPD in those at risk or confirm a diagnosis of COPD.

Results: To date, from two general practices, 702 “at risk” people and 226 previously diagnosed with COPD have been identified. Of these, 34 (5%) “at risk” and 13 (6%) previously diagnosed participants have attended the assessment. Based on spirometry results, 22% (7/34) “at risk” people showed obstruction ( $FEV1 \leq 0.7$ ) and 77% (10/13) of people with previously diagnosed COPD had diagnosis confirmed. 23% (3/13) previously diagnosed with COPD did not show airway obstruction. 17% (3/13) previously diagnosed with COPD had been referred to pulmonary rehabilitation at the time of baseline assessment. Following assessment, an additional 10 participants were referred to pulmonary rehabilitation.

Conclusion: Preliminary data for this novel GP-physiotherapist partnership indicates a rate of case finding similar to other studies. Few people with previously diagnosed COPD have ever been referred to pulmonary rehabilitation.

Key Practice Points:

- This integrated GP-physiotherapist partnership could improve identification of people with COPD who might benefit from pulmonary rehabilitation.

Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander peoples: If adapted to incorporate the sociocultural components of chronic respiratory disease, this model has the potential to be effective when working with Aboriginal and Torres Strait Islander people.

## IMPLICATIONS FOR AQUATIC EXERCISE FOR HUMANS: THE BIOMECHANICS OF CLOSED CHAIN MOVEMENT AND WALKING IN WATER

### Page C

Closed kinetic chain exercises and walking are commonly used in aquatic physiotherapy as they allow people with weakness or pain to successfully complete exercise independently. Forces due to buoyancy and drag can be changed in clinical settings to modify the parameters of each exercise. These modifications will have a significant impact on the control of movement, muscle activity and type of contraction and ultimately the outcomes of rehabilitation.

Key Practice Points:

- The effects of closed chain movement and walking in water on the human body.

## THE RAPID ACCESS MUSCULOSKELETAL CARE PROJECT

Page C<sup>1</sup>, Dowsey M<sup>2</sup>, Elliot J<sup>1</sup>, Kinsella R<sup>1,3</sup>, Choong P<sup>1,2</sup>

<sup>1</sup>St Vincent's Hospital Melbourne, Melbourne, Australia, <sup>2</sup>University of Melbourne, Melbourne, Australia, <sup>3</sup>La Trobe University, Melbourne, Australia

Aim: The primary objective of the project was to improve access for patients to appropriate osteoarthritis care. This involved implementation and evaluation of a specialist rapid access clinic located within the community. The project aimed to test strategies, including an innovative ‘SMART’ tool that assists with assessing suitability for surgery, in order to increase capacity for management in the community.

**Design:** Service implementation and evaluation as part of a Better Care Victoria grant 2017 in collaboration with local community partners.

**Methods:** Implementation of a community-located clinic providing assessment and treatment for patients with knee osteoarthritis utilising the existing Osteoarthritis Hip and Knee management framework. The staffing model included GP and advanced musculoskeletal physiotherapy, dietetic services if required for weight-management and orthopaedic surgeon input for assessment of patients with significant complexity (one hour/month). The 'SMART' tool was also evaluated.

**Results:** Patient satisfaction with the model of care was equivalent to similar hospital-based clinics. GPs indicated a high level of satisfaction with the service. The clinic delivered a high uptake of ongoing therapy (84%) and a low referral rate (12%) to surgery; as well as high patient discharge rates from the clinic back to their GP.

**Conclusion:** Specialist clinic services delivered in the community can improve outcomes in osteoarthritis, with reduced overall health-care costs.

**Key Practice Points:**

- Community-located specialist clinics delivering an integrated model of care are acceptable to patients
- GPs and advanced musculoskeletal physiotherapists can effectively deliver specialist clinic services for patients with osteoarthritis in a community setting.

## AUSTRALIAN CHRONIC HEART FAILURE REHABILITATION: A PICTURE OF CURRENT PRACTISE AND ENGAGEMENT LEVELS

Palmer K<sup>1</sup>, Morphet J<sup>1,2</sup>, Lane R<sup>3</sup>, Bowles K<sup>2</sup>

<sup>1</sup>Monash Health, Clayton, Australia, <sup>2</sup>Monash University, Frankston, Australia, <sup>3</sup>Victoria University, Melbourne, Australia

**Aim:** To explore and describe current CHF rehabilitation practise within Australia and to describe barriers to engagement in Chronic Heart Failure (CHF) rehabilitation programs and identify potential strategies to address them.

**Design:** An electronic survey

**Method:** A nation-wide electronic survey of cardiac and CHF rehabilitation programs in Australia. The survey explored six key focus areas - program design, patient demographics, exercise prescription, referrals, inclusion criteria, and program engagement.

**Results:** The survey was completed by 165 respondents, from all states and territories, and metropolitan, regional and remote areas. The majority of programs (>80%) were run in line with current Heart Foundation guidelines, offering multi-disciplinary education and supervised exercise across all three phases of rehabilitation. Program attendance levels ranged from 10%-90%. Poor condition-specific health literacy was identified as the most common barrier to engagement, as well as the lack of medical professional support and referral issues (timing and occurrence). Few strategies were reported to address these barriers. "Did Not Attend" were often due to transport issues, family and work commitments, medical stability and lack of motivation. Effective strategies for these issues were phone call follow ups and the use of family members for reminders and transport assistance.

**Conclusion:** While CHF Rehab programs in Australia are following Heart Foundation Guidelines, the results of this survey identify common barriers that need to be address to improve engagement and attendance

levels. Due to the interwoven personal, local and health service barriers, a multi-pronged approach would appear to be of greatest benefit.

**Key Practise Points:**

- Clinicians need to consider addressing poor CHF health literacy and improving support from medical professionals to improve rehabilitation engagement
- A multi factor approach, including better referral processes and options such as tele-rehabilitation and home based programs may address some personal and local barriers and improve rehabilitation attendance.

## THE ROLE OF ABORIGINAL TRADITIONAL HEALING PRACTICES FOR PHYSICAL, MENTAL, EMOTIONAL AND SPIRITUAL WELLBEING

**Panzironi F<sup>1</sup>**

<sup>1</sup>Anangu Ngangkari Tjutaku Aboriginal Corporation, Adelaide, Australia

**Objective:** To present on the role of Aboriginal traditional healing practices in clinical settings.

**Aims:**

- To raise awareness of the existence and role of 60,000 years old Aboriginal healing practices.
- To share Aboriginal methods of healing and share the benefits for people's physical, mental, emotional and spiritual wellbeing.
- Pain management - how Ngangkari work on pain relief.

**Key Practice Points:**

- To allow clinicians to acknowledge existing traditional healing methods and how they differ to metropolitan health care practices
- To recognise the indigenous community expectations and why they find the hospital experience so foreign
- To allow clinicians to reference the Ngangkari work whilst working with the indigenous population to help establish a connection to the patient's expectations on a patient centric health care system.

## ARE ICU PATIENTS SUSCEPTIBLE TO POOR RECOVERY OUTCOMES INCLUDING PHYSICAL INACTIVITY AND HEIGHTENED COMMUNITY FALLS RISK? MULTI-SITE INTERNATIONAL OBSERVATIONAL STUDY

**Parry S<sup>1</sup>**, Granger C<sup>2</sup>, Morris P<sup>4</sup>, Larkin J<sup>3</sup>, Jenkins D<sup>3</sup>, Beach L<sup>3</sup>, Denehy L<sup>1</sup>

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**Aim:** To explore post intensive care syndrome impairments, including falls and physical inactivity, in patients over the first year following an ICU admission.

**Design:** Prospective longitudinal multi-centre (Australia and USA) observational study

**Method:** Preliminary results on n=48 patients (from the Australia site) who were admitted to a quaternary ICU (63% male; age median 55 [21-81] years; predominantly medical 52% (n=25/48) or surgical 33% (n=16/48) admission categories). Patients completed a battery of assessments (physical, mental and cognitive) at pre-hospital discharge, and 3-, 6-, and 12-month follow-up.

Results: 6-month data demonstrated the majority of patients (87%) had at least one element of PICS and 23% had all three PICS elements present. 42% had severe fatigue. 61% of patients had at least 1 fall since hospital discharge, and 54% had multiple falls. Moderate to severe injury, where patients sought medical treatment, occurred in 17% of falls. Patients identified fatigue, weakness and poor balance as key causes for their falls. 50% were readmitted to hospital within 6-months; these patients had more comorbidities ( $p=0.044$ ); poorer strength, physical function and balance ( $p<0.05$ ) pre-hospital discharge compared to those not readmitted. Physical activity levels at 6 months were lower in patients readmitted (mean diff 2898 [95%CI 1019-4777] steps/day). Pre-hospitalisation 54% were employed, but only 31% had returned to work by 6 months.

Conclusion: Preliminary data suggests ongoing significant disability at 6 months post ICU discharge with new identified potential intervention targets for future trials around fatigue, falls/balance and physical inactivity.

Key Practice Points:

- Ongoing significant long term disability and impact on return to work evident
- Falls and physical inactivity are common issues post hospital discharge
- Potential to target fatigue, falls/balance and physical inactivity in the community to minimise readmission and long term disability for ICU survivors

## YEAR IN REVIEW: PHYSIOTHERAPY FOR SURVIVORS OF CRITICAL ILLNESS

Parry S

This 'year in review' session will identify key research published in the past 2 years concerning physiotherapy for survivors of a critical illness, with a focus on physical function across the recovery trajectory. Presented by an experienced researcher, attendees will gain insight as to how these studies might influence practice, and, future challenges and directions in this field. Year in review sessions are a brief but effective way to be orientated to current research from across the world and understand the evidence base for clinical practice.

## DO CONCUSSED AUSTRALIAN FOOTBALL LEAGUE PLAYERS HAVE SIMILAR SUBSEQUENT INJURY RATES AND REGIONS COMPARED TO PLAYERS RETURNING FROM OTHER INJURIES?

Pascoe R<sup>1</sup>, Jhala P<sup>1</sup>, Lee D<sup>1</sup>, White P<sup>1</sup>, Foulcher T<sup>1</sup>, Fuller J<sup>1</sup>

<sup>1</sup>Macquarie University, Sydney, Australia

Aim: Compare subsequent injury rates and regions in elite Australian football players who sustained concussion and non-concussion injuries.

Design: A prospective cohort study.

Method: Public Australian Football League injury lists were monitored during 2017-18 to identify players who sustained a concussion (concussion group) or non-head knock injury (control group) as their first injury of the season. Subsequent injury rates and regions (head, upper limb, trunk, lower limb and illness) were compared between groups using rate ratios and Chi-square tests, respectively. Subgroup comparisons were based on concussion severity (injury length).

Results: Ninety-six concussion and 663 control injured players were identified. Subsequent injury rates were similar between groups (rate ratio 1.02 [95% CI: 0.78-1.33];  $p = 0.894$ ) and for concussions with 1, 2, and >2-

week severity (67 vs 87 vs 51 injuries/ 1000 games;  $p > 0.289$ ). After concussion, players were less likely to sustain subsequent lower limb injuries (52.4% vs 69.7%;  $p = 0.010$ ) and more likely to sustain subsequent head, upper limb or trunk injuries (41.3% vs 25.4%;  $p = 0.013$ ). Subsequent illness incidence was similar (6.3% vs 5.0%;  $p = 0.871$ ).

Conclusion: Subsequent injury rate were similar between concussion and other injury types, regardless of severity, but were more likely to occur in the head, upper limb and trunk.

Key Practice Points:

- Current return-to-play timeframes after concussion have similar subsequent injury risk compared to non-concussive injuries.
- Subsequent injury prevention practices after concussion should place greater emphasis on the head, trunk and upper limb compared to non-concussive injuries.

## PROGNOSTIC FACTORS FOR PAIN AND DISABILITY IN CHILDREN WITH PERSISTING PAIN: A SYSTEMATIC REVIEW AND META-ANALYSIS

Pate J<sup>1</sup>, Hancock M<sup>1</sup>, Hush J<sup>1</sup>, Gray K<sup>1</sup>, Pounder M<sup>2</sup>, Pacey V<sup>1</sup>

<sup>1</sup>Macquarie University, Macquarie University, Australia, <sup>2</sup>The Children's Hospital at Westmead, Westmead, Australia

Aim: To investigate prognostic factors of pain and disability for children with persisting pain.

Design: Systematic review with meta-analysis of prospective cohort studies.

Method: Studies were identified from searches of electronic databases (MEDLINE, EMBASE, CINAHL, AMED and PsycINFO). To be included, studies had to be published peer-reviewed reports of children aged 5 to 18 years with pain persisting for at least one month. Studies also needed to report at least one baseline prognostic factor and the relationship with a pain or disability outcome at least one month after baseline. Two independent reviewers assessed study inclusion, completed data extraction, and evaluated quality using the Quality in Prognosis Studies (QUIPS) tool. To evaluate the direction and strength of the relationship between prognostic factors and the outcome, meta-analyses were performed using a random-effects model on prognostic factors, when reported in two or more studies.

Results: Of 10992 studies identified, 18 were included, investigating 50 potential prognostic factors. In clinical settings, meta-analysis of 3 studies of low-to-medium quality found that older age and higher baseline pain intensity predict medium-term pain, and higher baseline disability predicts short-term disability. In population-based settings, meta-analysis of 2 studies of low-to-medium quality found that older age, day tiredness, abdominal pain, and waking during the night predict medium-term pain.

Conclusion: Low-to-medium quality studies have examined potential prognostic factors for pain and disability in children.

Key Practice Points:

- For children in clinical settings, older age and higher baseline pain intensity predict pain, and higher baseline disability predicts disability.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Improved results specific to this population are not expected.

## HOW TO ENGAGE HUNDREDS OF THOUSANDS OF PEOPLE IN LEARNING ABOUT PAIN: THE 'WHAT', 'WHY', AND 'HOW'.

Pate J<sup>1</sup>

<sup>1</sup>Macquarie University, Sydney, Australia

Introduction/Background: Clinicians and researchers often repeatedly disseminate key research findings in one-to-one settings. Brief high-quality educational videos on the Internet enable learning to occur without these physical and temporal limitations [1].

Aims: To offer specific practical advice concerning how to develop online educational videos using the TED-Ed platform, to engage people in learning about pain.

Learning Objectives:

1. Discover the process of resource development, from idea to publication.
2. Define a suitable learning outcome and mould it for submission to a production team.
3. Observe an overview of the development and production process for an animated educational video.
4. Implement video-based resources in a clinical setting and consider their purpose and limitations (using an example from the Spark Pain Program at Westmead Hospital Pain Management Centre).
5. Explore future directions for increasing resource accessibility to rural and remote communities.

Approach: Participants will watch a TED-Ed video and the development process will be explained. Participants will also have access to the timetable of a low intensity pain management program to consider and discuss when videos can and should be utilised.

Key Practice Points:

- Targeted educational videos can enhance conceptual change education about pain provided by physiotherapists
- Clinicians and researchers can efficiently provide large-scale education by developing online educational videos

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Increase accessibility to high-quality online pain education resources.

References:

1. Heathcote, Lauren C., et al. "Pain neuroscience education on YouTube." *PeerJ* 7 (2019): e6603.

## YEAR IN REVIEW: CARDIORESPIRATORY EDUCATION AND CAREER DEVELOPMENT

Patman S<sup>1</sup>

<sup>1</sup>School of Physiotherapy, The University of Notre Dame Australia, Fremantle, Australia

This 'year in review' session will provide an overview of the state of play for cardiorespiratory education in Australia from student to specialist. This perspective is provided by an experienced educator and researcher reflected by their roles as immediate past-president of the International Confederation of Cardiorespiratory Physical Therapists (ICCrPT) and Specialist Cardiorespiratory Physiotherapist (as awarded by the Australian College of Physiotherapists). Attendees will also gain insight on the global context of cardiorespiratory physiotherapy education and postgraduate curricula. Year in review sessions are a brief but effective way to be orientated to current research and understand how individuals and the profession may be advanced.



## **PRESCRIBING BY PHYSIOTHERAPISTS: EXPANDED SCOPE OR STANDARD PRACTICE?**

Mcphail S<sup>1</sup>, **Pearce L<sup>2</sup>**, Anning J<sup>2</sup>, Pahor S<sup>2</sup>, Matthews L<sup>2</sup>, Nolan D<sup>2</sup>, Thompson D<sup>2</sup>, Peel B<sup>2</sup>, Hearn C<sup>2</sup>, Tsahtsarlis A<sup>2</sup>, Laherty R<sup>2</sup>, Semciw A<sup>3</sup>, Cruickshank M<sup>4</sup>, Nissen L<sup>5</sup>

<sup>1</sup>Queensland University Of Technology And Metro South Health, Fairfield, Australia, <sup>2</sup>Princess Alexandra Hospital,

Annerley, Australia, <sup>3</sup>La Trobe University, Bundoora, Australia, <sup>4</sup>Royal Brisbane Womens Hospital, Herston, Australia,

<sup>5</sup>Queensland University of Technology, Brisbane, Australia

**Aim:** To report the experiences of expanded scope physiotherapists when prescribing in a randomized controlled trial in a hospital outpatient setting.

**Design:** Two parallel arm, blinded randomised controlled trial with concealed allocation.

**Method:** Musculoskeletal spinal outpatients (n=106) referred and triaged for management at the Back Assessment Clinic, Princess Alexandra Hospital, were randomized to intervention (prescribing) or control group (usual care). Outcome measures were collected at baseline, 3 and 6 months and treatment-related information was recorded during each clinical encounter. Case reviews of intervention group participants were performed by two independent practitioners to evaluate prescribing practice management and safety.

**Results:** Preliminary analyses of case review audits and Medication Appropriateness Index (MAI) outcomes indicate that prescribing management by expanded scope physiotherapists in this context is appropriate and safe. Findings regarding the experiences of prescribing physiotherapists, including clinical examples involving simple and complex patients, and implications for implementing physiotherapist prescribing models will also be presented.

**Conclusion:** Prescribing by expanded scope physiotherapists in an outpatient setting is appropriate and safe; however, often complex, with several important considerations for the profession.

### **Key Practice Points:**

- The addition of prescribing to physiotherapy practice is complex and requires robust investigation and discussion by the profession
- Appraisal of physiotherapy prescribing from medical/allied health prescribing professionals is important for expanded scope development and patient safety

**Trial registration:** ACTRN12618001443280

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples:** Appropriate physiotherapists prescribing may improve medication access for all people with musculoskeletal spinal pain.

## **INTER-RATER RELIABILITY OF AN EXERCISE ADHERENCE MEASUREMENT TOOL: MEASUREMENT OF ADHERENCE VIA EXERCISE DEMONSTRATION (MOVED).**

**Peek K<sup>1</sup>**

<sup>1</sup>University Of Sydney, Lidcombe, Australia

**Aim:** To explore the inter-rater reliability of a combined measure of exercise adherence.

**Design:** Reliability study

**Methods:** Sixteen experienced physiotherapists used the Measurement Of adherence Via Exercise Demonstration (MOVED) tool to rate the level of patient adherence to exercise. The MOVED tool consists of

two parts. Part one: patients are asked to self-report the number of sets, repetitions and sessions per week they completed each exercise. Part two: patients are asked to demonstrate each exercise. The physiotherapist-prescribed exercise program is used as comparison. Individual component scores are totalled to give an overall level of patient adherence to each exercise. Raters were provided with a copy of five physiotherapist-prescribed exercise programs and then independently watched five corresponding video vignettes of simulated physiotherapist-patient consultations where patients were asked to self-report exercise frequency, sets and repetitions and demonstrate each exercise contained within the home-based program. Intraclass Correlation Coefficient (ICC) and 95% Confidence Interval assessed inter-rater reliability of MOVED scores.

Results: The ICC of part one (self-report) was .90 (95%CI .74-.98), part two (demonstration) .98 (95%CI .94-.99) and total score .96 (95%CI .88-.99), demonstrating excellent inter-rater reliability.

Conclusion: The MOVED tool, which can highlight whether patients are adhering to exercise technique as well as exercise frequency, may provide clinicians and researchers with a more robust measure of exercise adherence when compared with other measures currently available which generally only assess one component of adherence

Key practise points:

- The MOVED tool combines patient self-report with an observational component to assess patient adherence to home-based exercise
- MOVED demonstrated excellent inter-rater reliability when used by experienced clinicians in a simulated setting.

## HOW TO ASSESS FOR PAIN SENSITISATION: AN UPDATE FOR CLINICIANS

### Peek A<sup>1</sup>

<sup>1</sup>University of Sydney, Sydney, Australia

Background: Pain sensitisation is an important issue for clinicians because it can modify treatment effects in a negative manner and may relate to the prognosis of a person's condition. In the laboratory, quantitative sensory testing protocols are used to profile patients based on responses to somatosensory tests (such as heat, cold and pressure), to better understand pain sensitisation. Novel brain scanning techniques can now quantify brain neurochemicals associated with pain sensitivity. Our work has focused on translating these findings from the lab into clinical practice to inform appropriate patient management.

Aims / objectives: To improve clinicians' knowledge, skills and clinical reasoning in the clinical assessment of pain sensitisation. Subjective and objective assessment of pain sensitisation will be reviewed. Clinical relevance of brain neurochemical assessment will be reviewed. Clinical implementation, reasoning and implications for management will be discussed. A review of future directions will be given.

Approach: Lecture style presentation with time for practical demonstration and practice (for cold hyperalgesia). Discussion/question time allowed for at the end of the session.

Conclusion / Key Practice Points:

- Participants will be able to more accurately assess for pain sensitisation in their clinic.
- Participants will understand how to interpret pain sensitivity findings
- Participants will be able to understand how they may need to modify management based on pain sensitisation

## “MOVING FORWARD” – PRIVATE PRACTICE PLACEMENT CAPACITY AND QUALITY

Wells C<sup>1</sup>, **Peiris C<sup>2</sup>**, Reubenson A<sup>3</sup>, Lawton V<sup>4</sup>, Dunwoodie R<sup>5</sup>, Francis-Cracknell A<sup>6</sup>

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**Aim:** To explore factors perceived to enhance the supply and provision of high quality clinical placements for physiotherapy students in private practice.

**Design:** A mixed-methods study incorporating two nation-wide surveys and seven focus groups.

**Method:** University clinical education coordinators and clinical educators were invited to participate in a survey and/or focus group. Survey participants were asked to rate their level of agreement with factors proposed to increase the number and quality of clinical placements in private practice using a 5 point Likert Response Scale. Open-ended questions in surveys and focus groups provided the opportunity for in-depth exploration of themes regarding factors that may assist placement provision in private practice.

**Results:** Sixty-two participants completed a survey and 25 participants participated in focus groups. Survey participants “strongly” agreed that clinical educators should not lose income by supervising students and universities should contribute financially towards supervision costs. Other factors which may enhance the number and quality of placements included effective “communication and relationships” between coordinators and educators, clinical educator “engagement and recognition” and improvements in educator “training and support”.

**Conclusion:** Universities and private practices need to recognise clinical educator workloads and offset supervision costs. This may enhance clinical educator engagement and increase placement numbers. Placement quality may be enhanced by improved communication, relationships, training, and support of educators.

**Key Practice Points:**

- Clinical educator engagement and the number of placements may increase with recognition of supervision workloads and costs.
- Personalised and flexible educator training and support provided by clinical coordinators may enhance placement quality.

## “SAME, SAME, BUT DIFFERENT” – PRIVATE PRACTICE PLACEMENT MODELS AND CHALLENGES

Wells C<sup>1</sup>, **Peiris C<sup>2</sup>**, Reubenson A<sup>3</sup>, Lawton V<sup>4</sup>, Dunwoodie R<sup>5</sup>, Francis-Cracknell A<sup>6</sup>

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**Aim:** To explore different private practice clinical placement models and perceived challenges in sourcing and providing high quality placements for physiotherapy students.

**Design:** A mixed-methods study incorporating two nation-wide surveys and seven focus groups.

**Method:** University clinical education coordinators and clinical educators were invited to participate in a survey and/or focus group. Survey participants were asked to rate their level of agreement with proposed barriers to sourcing or providing high quality clinical placements in private practice on a 5 point Likert

Response Scale. Open-ended questions in surveys and focus groups provided opportunity for in-depth exploration of themes related to placement models and challenges.

Results: Sixty two participants completed a survey, and 25 participants participated in focus groups. Different models of clinical placements worked for different practices. Coordinators and educators “strongly” agreed that third party funding restrictions were challenging due to impact on student caseload and business income. Clinical educators also “strongly” agreed that supervisory time, efforts, and costs were barriers to placement provision. Meanwhile coordinators described the set-up-burden and quality control of placements as challenging.

Conclusions: Different placement models may suit different clinical educators and practices. Challenges in sourcing and providing high quality clinical placements are not unique to private practice but may be amplified for clinical educators and clinical coordinators.

#### Key Practice Points:

- Different placement models may suit different private practices and educators, and have different implications for supervision workloads and costs.
- Coordinators need additional time and resources to support educators in private practice to ensure quality placement experiences.

### “STATE OF PLAY” – PRIVATE PRACTICE PLACEMENTS AND BENEFITS

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Aim: In 2012 only 5-10% of physiotherapy students in Australia undertook a private practice clinical placement. This research aims to explore the number of private practice clinical placements in 2017 undertaken by physiotherapy students and perceived benefits.

Design: A mixed-methods study incorporating two nation-wide surveys and seven focus groups.

Method: University clinical education coordinators and private practice clinical educators were invited to participate in a survey and/or focus group. Coordinators provided 2017 placement statistics via a survey. Survey participants were asked to rate level of agreement with proposed benefits using a 5 point Likert Response Scale. Open-ended questions provided opportunity for in-depth exploration of themes in relation to perceived benefits in surveys and focus groups.

Results: Eighteen clinical coordinators and 44 clinical educators participated in the survey, and 12 and 13 in focus groups respectively. In 2017, 8,000 placements were sourced across 18 universities, and 9% of these placements were in private practice. Approximately 50% of students completed a 5-week private practice placement, and others undertook observational experiences. Several benefits were reported, however, survey participants “strongly” agreed that placements assist private practice owners in screening students for future employment and increase graduate work-readiness.

Conclusions: The proportion of students undertaking a private practice placement has significantly increased since 2012, and observational experiences expand opportunities. Private practice placements are perceived to benefit clients, students, universities, private practices, and the physiotherapy profession.

#### Key Practice Points:

- More students are undertaking private practice clinical placements.
- Private practice placements are perceived to benefit multiple stakeholders.

## IS PUTTING YOURSELF FIRST CRITICAL FOR THE PROFESSION?

**Stallman H<sup>1</sup>**

<sup>1</sup>*University of South Australia, Adelaide, Australia*

Health care professionals tend to the needs of others to help them function at their best. However, the ability to provide care in the short-term and also have an enduring, satisfying career is underpinned by self-care. In this presentation, Dr Stallman will focus on the components of self-care will be situated within the biopsychosocial model of health and wellbeing. The science of impact of poor self-care—sleep, nutrition, exercise, belonging and coping—will be explored. Finally, the rationale and steps in using the innovative Coping Planning approach to changing from unhealthy to healthy coping strategies will be outlined.

Ms Georgie Davidson will focus on the role of mindfulness in building our inner strengths and resources to take better care of ourselves and support personal happiness, health and a sense of meaning. Mindfulness is the human trait of paying attention with a curious and non-judgemental attitude to what is happening in the present moment in the internal world of sensations, thoughts and emotions and in the world around. Mindfulness is also a skill that can be further developed with practice. Research has found that a regular practice reduces stress, improves physical and mental health, fosters better personal and therapeutic relationships, and reduces burnout in health professionals. Evidence suggests that these positive outcomes are mediated by neurophysiological changes supporting metacognition, body awareness, attentional control, emotional and autonomic self-regulation and compassion to self and others.

## IS THERE A RELATIONSHIP BETWEEN ANKLE FLEXIBILITY, ENDURANCE AND POWER AND ANKLE OR FOOT INJURIES IN JUNIOR NETBALLERS?

**Peralta P<sup>1</sup>**, Jeffery S<sup>2</sup>, White-Alikakos D<sup>2</sup>, Breckenridge J<sup>1</sup>, Mungovan S<sup>1</sup>, Mills K<sup>2</sup>, Fuller J<sup>2</sup>

<sup>1</sup>*Sydney West Physio, Penrith, Australia*, <sup>2</sup>*Macquarie University, Macquarie Park, Australia*

**Aim:** Investigate whether ankle dorsiflexion range of motion, plantarflexor endurance and power are related to ankle and foot injuries in junior netball.

**Design:** A prospective cohort study.

**Method:** Seventy-eight netballers aged 12-15 years completed pre-season tests; dorsiflexion range (knee-to-wall distance), endurance (single-leg heel raise repetitions) and power (single-leg hop distance). Ankle and foot injuries were monitored throughout the subsequent season. Outcomes were compared based on lower limb injury status using Welch's t-tests. Receiver-operator curve analysis determined optimal test scores.

**Results:** Seven players sustained ankle or foot injuries. There were no differences between injured and uninjured players for dorsiflexion (11 vs 13 cm;  $p = 0.15$ ), endurance (11 vs 11 repetitions;  $p = 0.93$ ) and power (129 vs 136 cm;  $p = 0.12$ ) mean values nor left vs right asymmetry in dorsiflexion (1 vs 1 cm;  $p = 0.88$ ) and endurance (2 vs 4 repetitions;  $p = 0.44$ ). Power asymmetry was greater in the injured (8 vs 15 cm;  $p = 0.04$ ). An 11 cm asymmetry threshold was optimal for predicting injury risk (relative risk = 6.55 [95% CI 1.37 to 31.19], sensitivity = 71.4%, specificity = 76.8%).

**Conclusion:** Identifying meaningful ankle plantarflexor power asymmetry was moderately effective at estimating ankle and foot injury risk in junior netball. This finding needs to be validated in larger cohorts.

Key Practice Points:

- Single-leg hop distance asymmetry provides a clinically useful indication of ankle or foot injury risk in junior netballers.
- Dorsiflexion range and endurance were not related to ankle or foot injury.

## BLOOD FLOW RESTRICTED EXERCISE: TOLERABILITY IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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<sup>3</sup>Regional University of Cariri - URCA, Crato, Brazil

**Aim:** To compare tolerability of acute low load blood flow restriction resistance exercise with moderate load resistance exercise in people with chronic obstructive pulmonary disease.

**Design:** Randomised cross-over trial.

**Method:** Twelve individuals with moderate chronic obstructive pulmonary disease underwent two single session, knee extension protocols (random order), separated by seven days: a) moderate load, three sets of eight repetitions at 60% of 1-repetition maximum separated by 2-minute rest; b) low load blood flow restriction, four sets of twelve repetitions at 30% of 1-repetition maximum with 50% of the blood flow restriction pressure applied separated by 1-minute rest without occlusive pressure. Tolerability was assessed by dyspnoea (modified Borg 1-10) and leg discomfort (10cm scale) before and after each session.

**Results:** All participants completed each protocol. No significant differences were observed between participant groups at baseline. Dyspnoea and leg discomfort at end-exercise increased significantly from baseline for both protocols [end-exercise values: (blood flow restriction, dyspnoea:  $5.9 \pm 0.7$ , discomfort:  $6.7 \pm 0.6$ ; moderate load,  $5.5 \pm 1.0$ ,  $6.2 \pm 0.5$ ,  $p < 0.05$ )]. Tolerability did not differ significantly between protocols (mean differences: dyspnoea 0.42, 95% confidence interval, -0.30 to 1.14; leg discomfort 0.51, 95% confidence interval, 0.01 to 1.01).

**Conclusion:** Low load blood flow restricted exercise is as tolerable as moderate load exercise for people with chronic obstructive pulmonary disease.

Key Practice Points:

- In this sample, similar levels of discomfort were perceived between the moderate load exercise and low load blood flow restricted exercise.
- Blood flow restricted exercise might provide a novel mode of exercise for people with chronic obstructive pulmonary disease.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres

Strait Islander people: This research included only Brazilian participants and currently there is no data available on this novel training for non-indigenous Australians or Aboriginal and Torres Strait Islander People.

## BIOMECHANICAL MARKERS AFTER GLUTEAL TENDON RECONSTRUCTION: A COMPARISON WITH AGE AND SEX MATCHED CONTROLS.

**Perriman D<sup>2</sup>**, Fearon A<sup>1</sup>, Spratford W<sup>1</sup>, Sizeland T<sup>2</sup>, Gilbert S<sup>2</sup>, Lynch J<sup>2</sup>, Smith P<sup>2</sup>

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**Aim:** The aim of this study was to compare biomechanical gait parameters in people after gluteal tendon reconstruction (GTR) with age and sex-matched participants with no history or symptoms of hip dysfunction.

**Design:** A single-centre case-control study.

**Method:** Twenty-five GTR participants (6.8 ± 3.7 years after repair) and 29 healthy controls were recruited. Vicon® motion analysis technology was used to measure gait characteristics. A generalised linear model was used to compare hip-adduction moment, hip adduction and internal rotation range of movement pelvic obliquity, trunk lean, stride length and velocity throughout the stance phase of walking in both groups. **Results:** There were no differences between the groups for hip-adduction moment (1st peak GTR 70.1 ± 7.0 Nm; Control 72.9 ± 7.3 Nm), pelvic obliquity (1st peak GTR -3.1° ± 1.0; Control -3.0° ± 1.0), or hip adduction and internal rotation range of movement. GTR patients had a shorter stride length (mean (95%CI))(-0.1m (-0.1 to 0.0); p = 0.031) and reduced walking velocity (-0.1m/s (-0.2 to 0.0); p = 0.015). Ipsilateral trunk lean was reduced in GTR patients at the first-peak hip-adduction moment (1.6° (0.3 to 2.8); p = 0.016), mid-stance minimum hip-adduction moment (1.4° (0.1 to 2.6); p = 0.029) and second-peak hip-adduction moment (1.6° (0.5 to 2.8); p = 0.006).

**Conclusion:** The findings suggest that GTR may return the gait characteristics of Gluteal tendon tear patients to a status similar to matched healthy controls.

**Key Practice Points:**

- GTR is a biomechanically successful procedure
- Persistent gait abnormalities may be habitual tendencies

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples:** None of the participants in this study identified as indigenous. Therefore, we cannot draw any conclusions which are specific to the Aboriginal and Torres Strait Islander community.

## HOW BMI AND OTHER MORPHOLOGICAL FACTORS INFLUENCE KNEE KINEMATICS

Churchill A<sup>1,2</sup>, **Perriman D<sup>1,2,3</sup>**, Hribar N<sup>1,2</sup>, Galvin C<sup>1,2</sup>, Neeman T<sup>3</sup>, Lynch J<sup>2,3</sup>, Pickering M<sup>4</sup>, Smith P<sup>2,3</sup>, Scarvell J<sup>1,2</sup>

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**Aim:** The aim of this study was to investigate the effect of body mass index (BMI), weight, and height and knee size on knee kinematics in healthy knees during kneeling and step up.

**Design:** Cross-sectional observational study.

**Method:** 2D-3D image registration with single-plane fluoroscopy and computed tomography (CT) in 29 healthy participants aged < 56 years was used. The effect of four morphometric factors (BMI, weight, height and knee size) on in vivo tibiofemoral kinematics during a deep kneeling and step-up activity was investigated was investigated. The cohort was dichotomised according to size in each morphological



category. Tibiofemoral kinematics were analysed at the mid-point of flexion during each activity. Polynomial regression models were used to compare morphometric categories.

Results: People with higher BMI had restricted maximum flexion during deep kneeling ( $p=0.03$ ) and heavier people internally rotated earlier (BMI  $p<0.01$  and weight  $p=0.02$ , resp.). Those in the larger BMI and weight categories were more internally rotated at mid flexion and internally rotated earlier during deep kneeling. The taller height group was more medially translated at the mid-point of step-up ( $p<0.05$ ).

Conclusion: We found that people with higher BMI and weight demonstrated earlier internal rotation during deep kneeling which has not previously been reported. Changes in load may influence knee joint kinematics, but the relationships between BMI and other morphometric factors are not well understood, particularly regarding the impact on development of osteoarthritis.

Key Practice Points:

- Heavier people have altered knee kinematics.
- Training internal rotation control in kneeling may preserve the ability to kneel.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: None specific.

## CURRENT USE OF AIRWAY CLEARANCE TECHNIQUES IN THE MANAGEMENT OF INDIVIDUALS EXPERIENCING AN ACUTE EXACERBATION OF BRONCHIECTASIS

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Aim: Determine current physiotherapy practices in the use of airway clearance techniques in Australia and New Zealand for people experiencing an acute exacerbation of bronchiectasis.

Design: A cross sectional online survey was disseminated via professional bodies in Australia and New Zealand between August 2016 and April 2017.

Methods: Participants were physiotherapists who had treated adults or children diagnosed with an acute exacerbation of bronchiectasis in the preceding year. The survey was accessed by 130 physiotherapists, with 121 eligible participants.

Results: Participants (89%) reported prescribing airway clearance techniques for 81-100% of individuals during an acute exacerbation of bronchiectasis. Most commonly used techniques in adults were directed huffing (92%), exercise (89%) and active cycle of breathing technique (89%). Most commonly used in paediatrics were: new born-three years - percussion (85%) and positioning (77%); 4-10 years - directed huffing (100%) and exercise (85%); 11-18 years - directed huffing (92%) exercise (77%), active cycle of breathing technique (77%) and positive expiratory pressure therapy (77%). Factors considered most important in influencing the choice of technique were clinical presentation and the presence/absence of contra-indications/precautions.

Conclusion: This survey demonstrates that airway clearance techniques are routinely used as part of physiotherapy management of people experiencing an acute exacerbation of bronchiectasis, with the most common techniques applied dependent on age.

Key Practice Points:

- Airway clearance techniques are routinely used by Australian and New Zealand physiotherapists in management of individuals during an acute exacerbation of bronchiectasis.
- Technique choice is dependent on patient factors including age and clinical presentation.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Aboriginal and Torres Strait Islander people experience a disproportionately high burden of disease from bronchiectasis. This research will guide future research to improve the management of bronchiectasis which may improve health outcomes in the future.

## EXERCISE PROGRAMS THAT ADHERE TO GUIDELINES IMPROVE MOBILITY AFTER STROKE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aim: To determine if prescribing a combined aerobic and resistance exercise program in accordance with American Stroke Association guidelines improves mobility and physical activity levels of in adults with sub-acute or chronic stroke.

Design: Systematic review with meta-analysis of randomised trials.

Methods: The primary outcome was an objective measure of mobility (e.g. 6-Minute Walk Test, Timed Up and Go Test, 10-Meter Walk Test). The secondary outcome was physical activity. Risk of bias was assessed using the Physiotherapy Evidence Database Scale and overall quality of evidence was assessed using the Grades of Research, Assessment, Development and Evaluation approach.

Results: Eight randomised control trials with 499 participants were included. There was high-level evidence that exercise programs improve habitual walking speed (MD 0.07m/s, 95% CI -0.01 to 0.16) and walking endurance after stroke (MD 39.2 meters, 95% CI 17.2 to 61.2). There was moderate-level evidence of improvements on the timed up and go test (SMD 0.57, 95% CI 0.16 to 0.99). No differences were detected for other mobility measures or physical activity levels. Adherence was high and few adverse events were reported.

Conclusion: A combined exercise program comprising aerobic and resistance training that adheres to the American Stroke Association guidelines, is safe, and should be prescribed in addition to usual care to improve mobility.

Key Practice Points:

- Aerobic and resistance exercise delivered according to guidelines should be added to usual physiotherapy to enhance mobility.
- The effects of exercise programs on long-term physical activity remains unknown.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research is not specific for Aboriginal and Torres Strait Islander people and therefore improved results in this population aren't expected.

## DESIGNING AND FITTING OUT A NEW HOSPITAL. THE BENEFIT OF HINDSIGHT – WHAT WORKS WELL AND WHAT DOESN'T

Pollnitz P<sup>1</sup>

<sup>1</sup>SA Health, Adelaide, Australia

Background: Designing and building a new hospital and filling it with equipment creates many challenges and opportunities. The presentation describes the process we went through and lessons learnt along the way. The new Royal Adelaide Hospital opened in September 2017. The years proceeding this provided various opportunities to influence building design and equipment procurement decisions.

Aims/Objectives: To present and discuss successful strategies, pitfalls and frustrations when designing and fitting out a hospital, and with the benefit of hindsight what we would do differently.

Approach: The presentation describes the role a team of Occupational Health Physiotherapists played in design and equipment decisions, with key lessons highlighted.

Developing awareness of the many processes and key people and gaining the opportunity to influence or change decisions is challenging. Example consultation processes, risk assessments of work areas and equipment and patient journey scenarios are discussed to highlight successes and pitfalls.

Designers need a good understanding of the work processes and spatial needs for equipment and people movement within areas, just building to minimum guidelines and standards won't ensure that work areas are fit for purpose.

Key Practice Points:

Participants will learn key opportunities including:

- influencing the functional design brief
- reference documents that architects and builders utilise
- stakeholder understanding of when and what to refer for advice
- earlier involvement in design and specification workshops and discussions
- secondment of key personnel and developing the right relationships
- liaison with commissioning managers
- consistency and visibility of risk registers and databases

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: Design and fit out of health facilities should consider the sociocultural needs of different patient groups, including Aboriginal and Torres Strait Islander peoples, to optimise comfort and outcomes for this vulnerable group.

## ESTABLISHING A MILITARY-SPECIFIC INJURY PYRAMID TO INFORM INJURY RISK MANAGEMENT

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Aim: To establish a contemporary, military-specific, injury pyramid to inform injury risk management

Design: Literature review with quantitative synthesis.

Method: Recent reports documenting primary and secondary analyses of recorded injury rates, levels of injury severity, and levels of reporting and non- or under-reporting of injuries in Australian and United States military populations were gathered and reviewed. Key data were extracted and synthesised to

develop a contemporary military-specific injury pyramid for the Australian Defence Force (ADF) that could inform future injury risk management.

Results: The estimated ratio of fatalities: serious injuries: minor/ moderate injuries was 1: 62: 19550. Evidence indicates that half of the minor/ moderate injuries may go unreported and be self-managed, and that another 45% of minor/moderate injuries may be reported to ADF healthcare providers but not to work health and safety incident reporting systems. Top reasons for non-reporting include: fear of career impacts; avoiding duty-limiting medical profiles; inconvenience of seeking treatment; and avoiding negative perceptions from others.

Conclusion: Estimates of unreported injuries should be considered alongside reported injuries when estimating military injury risks. There a range of reasons military personnel do not report and instead self-manage their injuries. Understanding this assists in more accurately assessing injury risks and ensuring injury management (or self-management) is optimised and risks associated with injury self-management are well-managed.

Key Practice Point:

- Physiotherapists are well placed to develop context-specific occupational injury pyramids to inform organisational injury risk management
- Physiotherapists can play a vital role in injury risk management and optimising injury reporting.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this study, when applied in occupational injury risk management, are likely to benefit both Aboriginal and Torres Strait Islander personnel and non-Indigenous personnel.

## IMMERSIVE SIMULATION-BASED EDUCATION IMPROVES PHYSIOTHERAPY STAFF CONFIDENCE IN THE IMPLEMENTATION OF HIGH-FLOW OXYGEN THERAPY IN A DETERIORATING PATIENT

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Aim: To determine whether immersive simulation-based education, in a high-fidelity acute-care setting, improves staff confidence in the delivery of high-flow oxygen therapy

Design: Pre and post questionnaires to evaluate the implementation of high-fidelity, immersive clinical simulation

Method: Mater Health physiotherapy staff were provided with a baseline 20-question survey to evaluate perceived staff confidence levels in the implementation and delivery of ward-based standard acute respiratory physiotherapy interventions, with 29 out of 35 (82.8%) returned. Using a convenience sample of 12 physiotherapists across diverse adult inpatient practice settings, participants in small groups (n = 3) were invited to participate in an immersive, simulation-based clinical scenario on the use of high-flow nasal oxygen for a deteriorating patient. Post scenario, participants then completed a follow-up questionnaire, using the 5-point Likert scale, exploring their perception of the case, and subsequent confidence levels in the delivery of high flow oxygen for a deteriorating patient.

Results: Confidence was greatly improved in all participants following the simulation, with an observed 64.2% increase in the confidence of clinical management of a patient requiring high-flow oxygen therapy.

Conclusion: Immersive simulation scenarios improve staff perceptions of confidence in the assessment and application of high flow oxygen in a deteriorating ward patient. The results of the pilot have been used to inform further physiotherapy simulations, and form the foundation of an immersive simulation program for Mater Health's Physiotherapy Department.

Key Practice Points:

- Immersive simulation-based educational scenarios can improve staff confidence in the delivery of clinical interventions, such as high-flow oxygen therapy

## PREDICTION OF INDEPENDENT WALKING IN PEOPLE WHO ARE NON-AMBULATORY EARLY AFTER STROKE: A SYSTEMATIC REVIEW

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<sup>1</sup>University Of Canberra, Bruce, Australia, <sup>2</sup>University of Sydney, , , <sup>3</sup>ACT Health, , , <sup>4</sup>Macquarie University, ,

Aim: To determine, in patients who are non-ambulatory in the first month after stroke, which factors predict independent walking at 3, 6 and 12 months after stroke.

Design: A systematic review with meta-analyses of prognostic studies. Participants were non-ambulatory patients within the first month after stroke. Any factors measured within one month with the aim of predicting walking outcome were included. The associations between prognostic factors and walking outcomes at 3, 6 and 12 months were pooled.

Results: Fifteen studies comprising 2,344 non-ambulatory participants after stroke were included. Risk of bias was low in 7 studies and moderate in 8 studies. Age ( $R=-0.33$ ,  $p<0.01$ ), an intact corticospinal tract ( $OR = 8.3$ ,  $p<0.01$ ), leg strength ( $R=0.41$ ,  $p<0.01$ ), cognitive impairment ( $OR = 0.29$ ,  $p<0.01$ ), neglect ( $OR=0.42$ ,  $p<0.01$ ), incontinence ( $OR=0.43$ ,  $p<0.01$ ), sitting balance ( $R=0.51$ ,  $p<0.01$ ), and independence in ADLs ( $R=0.55$ ,  $p<0.01$ ) predicted walking outcome at 3 months after stroke. Age ( $R=-0.20$ ,  $p<0.01$ ), incontinence ( $OR=0.07$ ,  $p<0.01$ ) and sitting balance ( $R=0.64$ ,  $p<0.01$ ) predicted walking outcome at 6 months. There were insufficient data to examine walking outcome at 12 months.

Conclusion: Age, an intact corticospinal tract, leg strength, incontinence, cognitive impairment, neglect, sitting balance and independence in ADL in patients who are non-ambulatory early after stroke predict walking outcome at 3 months.

Key Practice Points:

- These predictive factors can guide rehabilitation, discharge planning and education of stroke survivors.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The utility of these predictive factors has not been examined in indigenous Australians.

Review registration: Prospero registration number CRD42018108794.

## AN ALGORITHM GUIDING CLINICAL DECISION-MAKING FOR TRANSITION OF LOCOMOTOR THERAPY BETWEEN LOKOMAT® AND BODY-WEIGHT SUPPORTED TREADMILL TRAINING IN SUBACUTE STROKE.

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**Aim:** To develop an algorithm guiding transition from the Lokomat® to body-weight supported treadmill training (BWSTT) as two common modalities of contemporary locomotor therapy in subacute stroke rehabilitation.

**Design:** Observational.

**Method:** Ten participants with subacute stroke were clinically judged as either being capable, or not capable, of completing BWSTT. This judgement was contrasted with: participants' Functional Ambulation Category (FAC) score; clinical evaluation of sit to stand and standing; Lokomat® settings; maximal active hip and knee flexion in standing; and gait kinematics in BWSTT. Based on the findings, a clinical decision-making algorithm was then proposed.

**Results:** Clinical judgement deemed four of ten participants capable of BWSTT. Unlike participants judged not-capable of BWSTT these participants: a) had a FAC of 1; b) performed sit to stand and standing balance with minimal support and even weight bearing; c) trained with Lokomat® settings: BWS<30%, GF <30-35%, speed >2.0kph; d) had >45 degrees standing active hip and knee flexion; e) had no significant issues with their physiological stepping pattern in BWSTT that could not be controlled with verbal or physical facilitation by only one person.

**Conclusion:** Participants clinically judged ready for BWSTT presented with a FAC of 1, more independence with function, more challenging Lokomat® settings and greater active volitional lower-limb control. We have proposed an algorithm to guide transition from the Lokomat® to BWSTT in stroke.

**Key Practice Points:**

- For locomotor therapy following stroke, the proposed algorithm recommends reviewing the potential for transition to BWSTT once a FAC of 1 is observed.

**Trial ethics:** HREC/17/SAC/198. Completed with the assistance of The Hospital Research Foundation on behalf of its donors.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The research relates to best practice stroke care without specific application to this population group.

## USING AUGMENTED PERFORMANCE FEEDBACK ACTIVITIES DURING LOKOMAT® THERAPY RESULTS IN MODERATE INTENSITY CARDIOVASCULAR EXERCISE IN SUBACUTE STROKE.

**Prideaux N<sup>1</sup>**, van den Berg M<sup>2</sup>, Drummond C<sup>2</sup>, Barr C<sup>2</sup>

<sup>1</sup>Northern Adelaide Local Health Network, Modbury, Australia, <sup>2</sup>Flinders University of South Australia, Adelaide, Australia

**Aim:** To determine whether sustained moderate intensity cardiovascular (CV) exercise can be achieved, as per National Stroke Guidelines, using the Lokomat® Augmented Performance Feedback (APF) activities in mobility-dependant patients with subacute stroke.

Design: Observational – relationship between oxygen consumption and Lokomat® use.

Methods: Ten subacute patients with stroke, mean (SD) age of 63.4 (13) years, participated in six 20-minute Lokomat® sessions, completing each session a randomised order of three 5-minute APF activities. The COSMED K5 collected metabolic data and participants rated perceived exertion (RPE) on the CR-10 BORG scale. Lokomat® settings were also recorded.

Results: Moderate intensity CV exercise was achieved in all three APF activities, demonstrated with a mean (SD) VO<sub>2</sub> of 8.0 (3.8) ml/kg/min (estimated 52% VO<sub>2</sub> max) and mean (SD) MET of 3.1 (1.3). This was supported by BORG scores between 3 and 5. VO<sub>2</sub> and MET were not affected by type of APF activity ( $p = 0.110$  and  $0.240$ ) and VO<sub>2</sub>, MET and BORG results were maintained over 15 minutes. Lokomat® BWS and GF significantly progressed ( $p < 0.05$ ) as per clinical practice without significant changes in VO<sub>2</sub> or MET over the six sessions ( $p = 0.380$  and  $0.527$ ).

Conclusions: Sustained moderate intensity CV exercise, in line with recommended guidelines, can be achieved in mobility-dependant patients with subacute stroke using the Lokomat® APF activities and optimal device settings.

Key Practice Points:

- The Lokomat®, with optimised settings and therapist or patient choice of APF activity, should be considered in mobility-dependent subacute stroke rehabilitation to meet CV exercise guidelines.

Trial ethics: HREC/17/SAC/198

Completed with the support of The Hospital Research Foundation on behalf of its donors.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The research relates to best practice stroke care without specific application to this population group.

## **“IT’S THE ULTIMATE OBSERVER ROLE...YOU’RE FEELING AND SEEING WHAT’S HAPPENING TO YOU”: PHYSIOTHERAPY STUDENTS’ EXPERIENCES OF PEER SIMULATION**

**Pritchard S<sup>1</sup>**, Dalwood N<sup>1</sup>, Keating J<sup>1</sup>, Nestel D<sup>3</sup>, Blackstock F<sup>2</sup>

<sup>1</sup>Monash University, Frankston, Australia, <sup>2</sup>Western Sydney University, Campbelltown, Australia, <sup>3</sup>Monash University, Clayton, Australia

Aim: To explore physiotherapy students’ experiences and perspectives of participating in peer simulation, where students portray patients with their peers in simulation-based education.

Design: Qualitative study underpinned by an interpretivist research paradigm.

Method: Second year physiotherapy students (n=16) at Western Sydney University completed online blended with face-to-face education of generic SP skills and a specific patient role, and three 2-hour simulation sessions. Two focus groups to investigate students’ experiences were conducted by one researcher using a topic guide. Focus groups were audio recorded and transcribed prior to inductive thematic analysis by two researchers. Ethics approval was obtained.

Results: Two primary themes were identified: learnings from peer simulation, and impressions of peer simulation. Students underestimated what they did not know about patients’ perspectives of healthcare and health conditions, and thought their clinical reasoning and critical thinking skills were challenged. Peer



simulation was unexpectedly realistic for students, which enabled powerful learning experiences from patients' and therapists' perspectives. Portraying patients was possible with preparation. Discomfort and mistakes were valued for learning. Honouring real patients' perspectives was important to students.

Conclusion: Physiotherapy students acquire diverse new insights during peer simulation that appear to enrich their understanding of the healthcare interaction from patients' perspectives.

Key Practice Points:

- Physiotherapy students' learning in peer simulation appears similar to the powerful learning experiences of health professional students in other immersive simulation modalities
- Students in this study obtained new knowledge about patients' experiences of receiving healthcare and interacting with health professionals

## PHYSIOTHERAPY STUDENTS CAN LEARN TO PORTRAY REALISTIC PATIENT ROLES IN SIMULATION: A PRAGMATIC OBSERVATIONAL STUDY

**Pritchard S<sup>1</sup>**, Keating J<sup>1</sup>, Nestel D<sup>2</sup>, Blackstock F<sup>3</sup>

<sup>1</sup>Monash University, Frankston, Australia, <sup>2</sup>Monash University, Clayton, Australia, <sup>3</sup>Western Sydney University, Campbelltown, Australia

Aim: To investigate whether targeted education was associated with changes to physiotherapy students' abilities to portray patient roles in peer simulation.

Design: Observational study comparing ratings of students' portrayals of patients' roles before compared to after education about portraying patients' roles.

Method: Second year physiotherapy students (n=40) at Western Sydney University completed online blended with face-to-face education of generic simulated patient skills and a specific patient role. Students were video-recorded portraying patients' roles in practical exams before and after the program. Two independent assessors, blind to whether the video was recorded before or after education, rated the overall quality of portrayals using a purpose-developed instrument. Ethics approval was obtained.

Results: Twenty-three sets of pre- and post-program videos were analysed. Correlation coefficients between assessors spanned 0.60-0.80 for analyses of interest, which justified using average assessor ratings in analysis. Statistically significant higher scores were seen for post-program assessments for overall portrayal quality ( $p = 0.01$ ), and for sub-categories of accuracy ( $p = 0.02$ ) and realism ( $p = 0.02$ ).

Conclusion: Specific education for patient role portrayal appears to be associated with improvements in quality and realism. Further investigation in large robust controlled trials comparing peer simulation to other approaches to simulation and clinical education is warranted.

Key Practice Points:

- Physiotherapy students appear capable of portraying realistic simulated patient roles
- Peer simulation has the potential to be a lower-cost and effective approach to simulation-based education

## EFFECTS OF EXERCISE ON ARM AND HAND FUNCTION IN PEOPLE WITH PARKINSON'S DISEASE: A SYSTEMATIC REVIEW

**Proud E<sup>1</sup>**, Blennerhassett J<sup>2</sup>, Miller K<sup>1,3</sup>, Tan J<sup>4</sup>, Morris M<sup>5,6</sup>, McGinley J<sup>1</sup>

<sup>1</sup>The University of Melbourne, Parkville, Australia, <sup>2</sup>Austin Health, Heidelberg, Australia, <sup>3</sup>Sunny Hill Health Centre for Children, Vancouver, Canada, <sup>4</sup>Bionics Institute, Melbourne, Australia, <sup>5</sup>North Eastern Rehabilitation Centre, Healthscope, Ivanhoe, Australia, <sup>6</sup>La Trobe University, Bundoora, Australia

**Aim:** To explore the effectiveness of interventions targeting upper limb function in people with Parkinson's disease.

**Design:** Systematic review using PRISMA guidelines.

**Methods:** Five databases were searched (PubMed, MEDLINE Ovid, PEDro, CINAHL, Cochrane Database), with hand searching of systematic reviews and references. Inclusion criteria were 1) participants with Parkinson's disease; 2) active movement/exercise intervention; 3) aim to improve upper limb function; 4) evaluation of upper limb activity/participation; 5) n>1; and 5) English full text.

**Results:** We identified six randomised and two non-randomised studies of varying methodological quality, including 369 participants with mild to moderately severe Parkinson's disease. Interventions were task-related (seven studies) or resistance training (one study) delivered in standardised or individualised format. Programs ranged from two to 24 weeks duration and were mostly home-based. Four studies specifically focused on handwriting. Outcomes included manual dexterity (measured with tools such as the 9-Hole Peg Test); handwriting parameters; and self-reported arm and hand function. Five studies (n = 236) demonstrated significant improvements in dexterity or handwriting following training or exercise, and meta-analysis of four randomised general training trials found a small positive post-intervention effect on dexterity (SMD = 0.89; 95%CI 1.64, 0.14).

**Conclusion:** Upper limb interventions in Parkinson's disease are predominantly task-related but vary in focus, intensity and duration. Those delivering task-specific training may improve dexterity and hand function in people with Parkinson's disease.

**Key Practice Points:**

- Interventions incorporating training of hand skills and exercise may improve function in people with Parkinson's disease.
- Further investigations are needed to establish optimal training methods.

## EVALUATION OF A NEW ALLIED HEALTH PREHABILITATION MULTIDISCIPLINARY SERVICE AT THE PETER MACCALLUM CANCER CENTRE

Crowe J<sup>1</sup>, **Quinn S<sup>1</sup>**, Martin A<sup>1</sup>, Bucci L<sup>1</sup>, Samaranayake E<sup>1</sup>

<sup>1</sup>Peter Maccallum Cancer Centre, Melbourne, Australia

**Aim:** Preliminary evaluation of a new allied health prehabilitation multidisciplinary service (exercise, nutrition and psychology) for risk-stratifying patients into a tailored and individualised model of prehabilitation.

**Design:** Retrospective data analysis of clinic uptake and clinic utilisation including; number of new referrals, group attendance, program adherence, modality of service, external referrals placed, program duration, and interdisciplinary referrals made.

Method: Retrospective data analysis of all patients who received referrals to allied health prehabilitation service.

Results: Service commenced in March 2019, first scheduled evaluation is in June 2019 therefore initial evaluation results not yet available. Analysis of these results will be completed August 2019 and available for presentation at this conference.

Conclusion: These findings will inform clinicians about the success of the current service design. The results will inform timely changes to the current model of care to ensure the clinic meets the needs of the target patient group and is resource viable. Other services could extrapolate these results to assist in development of their own allied health prehabilitation program.

Key Practice Points:

- Formal and early evaluation is essential in service development.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this service development are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## IDENTIFYING REASONS FOR NON-ATTENDANCE IN AN ACUTE INPATIENT ONCOLOGY EXERCISE CLASS.

Quinn S<sup>1</sup>, Hall T, Edbrooke L

<sup>1</sup>Peter MacCallum Cancer Centre, Parkville, Australia

Background: Exercise in oncology populations can improve patient outcomes and alleviate side effects. Encouraging physical activity whilst a hospital inpatient prevents functional decline prevents deconditioning. Barriers to participation in exercise include; motivation, fatigue and side effects. To our knowledge there is no literature identifying barriers to participation in an inpatient oncology setting.

Aim: To report inpatient exercise class attendance rates and analyse reasons for non-attendance in an acute oncology setting.

Method: An observational prospective cohort study design was used to collect data on reasons for exercise class non-attendance between October and December 2018. Descriptive statistics were used to report attendances and chi-square was used to analyse differences between wards for attendance rates and reasons for non-attendance.

Results: 570 inpatient attendances were scheduled from (n (%)) medical (178 (31)), surgical (155 (27)), haematology (237 (42)) wards. Overall attendance rate was 50% (284/570). No statistically significant differences in attendance between wards (chi square=5.09, p=0.08; medical 53%, surgical 55%, haematology 44%). Main reasons for non-attendances were (% (n)): unwilling to participate 27% (76), conflicting appointments 18% (51), patient feeling unwell 17% (49), deemed inappropriate by staff 15% (42) and haematological parameters contraindicating participation 14% (40). There were significant differences for non-attendance on the haematology ward (chi-square = 53.6, p<0.001) with increased non-attendances for haematological parameter contraindications (27% versus 5% and 0% for medical and surgical respectively).

Conclusion: The greatest barrier to participation was unwillingness to participate. Education for inpatients regarding benefits of exercise may improve participation.

Key Practice Points:

- Education about benefits of exercise in the Oncology setting may improve participation.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## REPRODUCIBILITY OF THE TIMED UP AND GO (TUG) STANDARD AND DUAL-TASK VERSIONS IN SCHOOL-AGED CHILDREN WITH AND WITHOUT COORDINATION DIFFICULTIES.

**Raatz B<sup>1</sup>**, Dewar R<sup>1</sup>, Allinson G<sup>1</sup>, Hannah S<sup>2</sup>, Johnston L<sup>1</sup>

<sup>1</sup>*Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, St Lucia, Australia,*

<sup>2</sup>*St Peters Lutheran College, Lower Primary School, Indooroopilly, Australia*

**Aim:** to evaluate intra-rater and test-retest reproducibility of the Timed-Up-and-Go (TUG) standard and dual-task versions in children with and without coordination difficulties.

**Design:** Intra-rater and test-retest reproducibility

**Method:** Children participated in intra-rater and test-retest reproducibility evaluation of three TUG versions: the TUG-standard, TUG-motor and TUG-cognitive. Reproducibility was examined by reliability and agreement. TUG time data was used to examine intra-rater and test-retest reliability (using Intra-class Correlation Coefficients), smallest detectable change and limits of agreement. Categorical ratings, available from the Kids-BESTest for TUG-standard and TUG-cognitive only, were used to examine agreement (percent exact agreement, kappa). Data was assessed for age-related TUG performance.

**Results:** Intra-rater and test-retest reliability was good-excellent for all TUG versions (range ICC=0.63-0.86), except intra-rater reliability of TUG-cognitive (ICC=0.44). For all versions, Trial-2 was more reliable than Trial-1 or Trial-average. Both the TUG-standard and TUG-cognitive showed excellent agreement (Kappa=0.77-1.0).

**Conclusion:** TUG-standard and dual-task assessment is reproducible for children aged 4-12 years. Children should be provided with one practice trial, then the results of their second trial recorded.

Key Practice Points:

- TUG-standard and dual-task assessment is reproducible for children aged 4-12 years
- Children should have one practice trial, then the results of their second trial scored

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## EXERCISE DELIVERED VIA TELEHEALTH TO REDUCE SECONDARY STROKE RISK NEEDS THE RIGHT EQUIPMENT, RESOURCES AND CLINICIAN TRAINING TO OPTIMISE SUCCESS

**Ramage E<sup>1,2,3</sup>**, Burke M<sup>1</sup>, Galloway M<sup>1,2</sup>, Janssen H<sup>1,2,4</sup>, Lynch E<sup>5</sup>, Marsden D<sup>1,2,4</sup>, Patterson A<sup>1</sup>, Pollack M<sup>1,3,4</sup>, Said C<sup>6,7</sup>, English C<sup>1,2,3</sup>

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<sup>3</sup>Florey Institute of Neuroscience and Hunter Medical Research Institute, Centre for Research Excellence in Stroke Recovery and Rehabilitation, Newcastle, Australia, <sup>4</sup>Hunter New England Local Health District, Newcastle, Australia,

<sup>5</sup>University of Adelaide, Adelaide, Australia, <sup>6</sup>Physiotherapy, Western Health, St Albans, Australia, <sup>7</sup>Physiotherapy, University of Melbourne, Parkville, Australia

**Aim:** To identify the barriers, facilitators and essential elements required in a program of supervised exercise delivered via telehealth for stroke survivors.

**Design:** Observational sub-study of an integrated knowledge translation (iKT) project.

**Method:** The Stroke Rehabilitation and Recovery Roundtable recommendations and an iKT approach was applied to a pragmatic intervention co-design process. This involved four group workshops with purposively sampled physiotherapists (n=8; median years of experience delivering exercise 21; median years experience in the delivery of supervised exercise via telehealth 3.5). Physiotherapists identified barriers, facilitators and essential elements required for successful supervised exercise programs delivered via telehealth.

Recommended outcome measures to inform the feasibility of these programs were also identified.

Workshop audio recordings and notes were summarised and checked by participants.

**Results:** Aspects of the exercise environment, limitations of technology and patient complexity can form barriers to supervised exercise delivered via telehealth. Strong communication skills, clinician experience, equipment choice, appropriate resources, peer support and adequate time for troubleshooting are essential to ensure program success.

**Conclusion:** Clinician skills and training, and equipment choices are critical to the success of exercise delivered via telehealth.

### Key Practice Points:

- Limitations of technology can be successfully managed in exercise delivered via telehealth
- Effective communication skills are essential to the success to telehealth delivered exercise
- Resources, equipment, opportunity for peer support and the need for in-home visits should be tailored to the needs of the patient and demands of the environment

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This research may be used to inform the development of services that can address a scarcity of health service provision for people (including Aboriginal and Torres Strait Islander people) living in rural and remote locations.

The Hunter New England Human Research Ethics Committee approved this research.

## THE OREBRO MUSCULOSKELETAL PAIN QUESTIONNAIRE (SF-OMPSQ) STRATIFIES WELL FOR RISK OF NON-RECOVERY IN MUSCULOSKELETAL INJURES AFTER ROAD TRAFFIC ACCIDENTS (RTA)

**Rebbeck T<sup>1</sup>**, Nguyen H<sup>2</sup>, Kifley A<sup>2</sup>, Jagnoor J<sup>2</sup>, Nicholas M<sup>3</sup>, Cameron I<sup>2</sup>

<sup>1</sup>Faculty of Health Sciences, University Of Sydney, Lidcombe, Australia, <sup>2</sup>John Walsh Centre for Rehabilitation Research, University of Sydney, St Leonards, Australia, <sup>3</sup>Pain Management Research Institute, University of Sydney, St Leonards, Australia

**Aim:** To determine whether the SF-OMPSQ stratifies for risk of non- recovery in people with musculoskeletal injures after RTA.

**Design:** Inception longitudinal cohort study. Risk stratification tools identifying people with poor prognosis have been validated for individual conditions (eg low back pain, whiplash). However a single tool validated across different musculoskeletal conditions after RTA is lacking.

**Method:** People with acute (<4 weeks) musculoskeletal injuries (low back pain, whiplash, lower limb) were recruited, Baseline data included demographic and injury information. Participants were stratified at baseline into low (SF-OMPSQ  $\leq$  50) and high risk (SF-OMPSQ > 50) of non-recovery. Primary outcome was Global Perceived Recovery at 6 months Secondary outcomes were health related quality of life (SF-12) and return to work.

**Results:** 499 people (166 with neck, 78 with lower back and 254 with lower limb injuries) participated. Significantly more people in the low risk group recovered at 6 months compared with high risk for all musculoskeletal conditions (proportion of people recovered low vs high risk were: low back 56.5% vs 14.3%, whiplash 68.5% vs 26.1%, lower limb 61.9% vs 17.2%; RR 2.96 (95% CI: 1.81 to 4.82). There were no differences between injury types.

**Conclusion:** The SF-OMPSQ demonstrated good prognostic ability to identify people early after RTI who are at risk of poor recovery.

### Key Practice Points:

- Clinicians and researchers can be confident in using the SF-OMPSQ to identify people with musculoskeletal injuries at low or high risk of non-recovery.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Aboriginal and Torres Strait Islanders were included in this cohort study, hence conclusions are relevant to them.

## HOW TO DELIVER A NOVEL HEALTH CARE MODEL FOR COMMON MUSCULOSKELETAL DISORDERS: AN EXPANDED AND INTEGRATED CARE PATHWAY FOR PHYSIOTHERAPISTS

**Rebbeck T<sup>1</sup>**, Beales D<sup>2</sup>, Evans K<sup>1</sup>

<sup>1</sup>The University of Sydney, Sydney, Australia, <sup>2</sup>Curtin University, Perth, Australia

**Background:** Growing evidence supports stratified care based on prognostic profile for patients with common musculoskeletal disorders. Evidence-informed clinical guidelines exist but are poorly implemented in primary care, resulting in inefficient use of resources and poor patient outcomes. In this proposed clinical pathway of care, physiotherapists play a key role in better identifying and effectively managing patients with musculoskeletal disorders based on risk stratification and guideline-based recommendations.

**Aims/objectives:** Synthesise evidence relating to stratified care and present an innovative clinical pathway with a strong physiotherapy focus. Participants will be competent in assessing prognosis in common musculoskeletal conditions and understand key management principles, concordant with guideline-recommended care. Participants will have greater understanding of when/how to optimise referral into the pathway.

**Approach:** Background information presented on risk assessment and the clinical pathway (8-mins) and interactive discussion regarding barriers/solutions and the role of musculoskeletal clinicians (10-mins). Resources (e.g, videos, demonstrations) will highlight how to optimise referral (10-mins).

**Key Practice Points:**

For patients with low back pain, neck pain, whiplash and knee osteoarthritis, participants will know how to:

- integrate risk assessment into clinical practise
- access evidence-informed clinical guidelines
- implement the clinical pathway
- improve collaboration between physiotherapists

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:**

The emphasis on self-management strategies (for patients at low risk) and resources available as part of the clinical pathway may be applicable for people living in rural and remote communities but will be most effective if delivered in an equitable and culturally sensitive manner.

## HOW DO CLINICAL EDUCATORS USE THE ASSESSMENT OF PHYSIOTHERAPY PRACTICE (APP) TOOL IN THE WORKPLACE?

**Riglar E<sup>1</sup>**, Molloy E<sup>1</sup>, Ryan A<sup>1</sup>

<sup>1</sup>*Department of Medical Education - The University of Melbourne, Parkville, Australia*

**Aim:** To explore the real-life experience of physiotherapist clinical educators using the APP.

**Design:** This was an interview-based study.

**Method:** Semi-structured interviews were conducted with physiotherapists involved in the supervision of second year University of Melbourne physiotherapy students. Interviews included a “think-aloud” reflective component, where questions were asked in relation to an APP form that had been completed within the previous two weeks. Thematic analysis was employed to interpret data.

**Results:** Preliminary results indicate that physiotherapists develop personal frameworks to enable them to make decisions about student performance and how to rate them on the APP. Despite educators reporting similar rhetoric about the intention of the APP instrument, there was wide variation in how clinicians complete the tool and use it to guide decision-making about learner performance. All clinicians reported a substantial time burden in the completion of the APP and delivery of feedback using the tool, with supervisors spending up to an hour per student. Additionally, there appears to be poor knowledge regarding the evidence behind and correct usage of the APP, despite formal training.

**Conclusion:** Variation exists in how the APP is used between educators. Further work is required to determine how to standardise educator use of the APP.

**Key Practice Points:**

- Despite training, there is significant variation in how clinical educators use the APP in practice.



- Clinicians appreciate the importance of feedback around ‘standards’ however this means the APP creates a large time burden.
- Informal peer learning in the workplace is an influential factor in how novice educators develop skills in using the APP.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: Purposeful and thoughtful assessment of Physiotherapists nationally may improve the quality of graduates who are working with Aboriginal and Torres Strait Islander peoples to improve their health goals.

## THE HYOID AND BEYOND: UNDERSTANDING THE IMPLICATIONS OF DYSFUNCTION

Riley E<sup>1</sup>

<sup>1</sup>*Evolve Manual Therapy,*

The aim of this presentation is to give an overview of the complex anatomy of the hyoid and its myofascial attachments in people, horses and dogs. Participants will gain an in-depth understanding of how hyoid dysfunction contributes to a range of myofascial and biomechanical issues as well as its impact on the central nervous system regulation through its impact on the myodural bridge and dura mater.

Key Practice Points:

- Participants will learn how to palpate the hyoid with greater accuracy
- Participants will gain understanding of how to treat the hyoid and its related myofascia
- Participants will gain an understanding of how hyoid dysfunction impacts on central nervous system regulation

## LOADING, TENDONS AND PINK FLAGS

Rio E<sup>1</sup>

<sup>1</sup>*La Trobe Sport and Exercise Medicine Research Centre, Melbourne, Australia*

Tendinopathy is a load based, persistent pain condition. Understanding the challenges associated with diagnosis and the interplay between loading and loading types in its clinical presentation and management are critical.

Local tenderness on palpation and imaging are commonly used to diagnose tendon pain but have limitations including specificity and an ongoing narrative for the patient that their tendon must be “fixed”. Further, common clinical tests may lack specificity and provoke symptoms in multiple clinical presentations leading to confusion around diagnosis. Exercise is a fundamental part of tendinopathy management that promotes self-efficacy but determining the initial load and load type to be used can be difficult.

This presentation will unravel the challenges associated with diagnostic criteria for tendinopathy in the anterior knee and Achilles region with a strong focus on the use of language (for example around imaging outcomes and terms like tendinitis) and how language affects patient perception of their condition and treatment selection. The latest international consensus on reporting of research participant characteristics and terms will be outlined to guide clinical utility of research and inform your interaction with colleagues and patients (including attitudes and beliefs associated with positive outcomes – “pink flags”). Recommendations for establishing loading protocols in lower limb tendinopathy management will also be discussed.

Key Practice Points:

- Understanding the patient’s perception of their condition can transform our assessment and management of tendinopathy (including advice).

- Key features of tendon pain will be highlighted to assist with your diagnosis
- Identify provocative loads and starting loads
- Encouraging “pink flags” can positively influence outcomes

## SHORT TERM, INTENSIVE AQUATIC PHYSIOTHERAPY FOR SPINOCEREBELLAR ATAXIA

Roberts M<sup>1,2</sup>

<sup>1</sup>Murdoch Children’s Research Institute, Melbourne, Australia, <sup>2</sup>Monash Health, Melbourne, Australia

This case study explores the outcomes of an intensive aquatic (and land-based) physiotherapy program for a 63-year-old male presenting with spinocerebellar ataxia type 6 (SCA6). The client’s main problems included disturbance of balance, gait and coordination. In addition to the physical features of SCA6, the patient experienced high levels of anxiety and fear of falling and was initially very hesitant to be involved in aquatic physiotherapy. His goal was to progress from walking with a 4-wheel-frame to walking unaided. Aquatic-based treatment occurred three days per week for one hour each for six weeks and included exercises for balance, postural control and reducing fixation. Following the aquatic physiotherapy program, the client was able to mobilise independently in the pool, was keen to independently continue exercising in the pool following the physiotherapy program and balance and mobility gains were translated to mobility improvements on land.

Key Practice Points:

- For people with spinocerebellar ataxia aquatic physiotherapy provides an opportunity to challenge balance and increase confidence of movement.

## LIFTING WITH A ROUND-BACK IS SAFE. A CASE STUDY THAT CHALLENGES ERGONOMIC BELIEFS

Roberts P

Lifting and bending with a “straight back” with “bent knees” are currently taught and advocated universally by manual handling guidelines, lifting training protocols in workplace settings and sport. A “straight-back” during bending and lifting is often advocated by health care providers as ergonomically safe, whilst a “round-back” is often viewed as dangerous (Caneiro et al, 2019).

However, the evidence that lifting with a round back is a risk factor for LBP is debatable, with more confirming evidence, that not being fit for the work and unhelpful protective behaviours, are greater risk factors for back injury and persistent pain.

Emerging evidence in the literature both from biomechanical studies and qualitative case studies advocate that lifting and bending with natural, spontaneous spinal movement is efficient, safe and normal. There is consistent evidence to suggest that protective behaviours such as avoidance of spinal flexion are common in people with persistent LBP who have not recovered within expected time frames. Advice given by health care providers to protect the back by avoiding lifting and bending with a round back may in fact be unhelpful.

In this presentation, Peter will highlight how potential contributing factors, and the adoption of a ‘guideline-recommended straight-back posture’ were unhelpful to recovery.

These aspects will be illustrated in the case study, with a short review of current literature regarding this paradigm.

#### Key Practice Points:

- Participants will be exposed to evidence-based understandings, regarding the safety of the individual's natural way of bending of the back and the role of resilience building in achieving full recovery and minimising the opportunity for injury.
- Practical examples of education strategies and activities to facilitate helpful and safe movement behaviours, especially of the case study in question, will be illustrated during the presentation.

## ACL REHABILITATION BEST PRACTICE TRANSFORMING THE KNEE CLINIC

### Rooney J

Over nine weeks Jane travelled to the United Kingdom, Ireland, the Netherlands, Denmark, Norway, Sweden and the United States, to visit the world's leading experts in ACL injury management. Jane investigated contemporary conservative management programs for anterior cruciate ligament injuries including management algorithms, prehabilitation, non-operative, prevention and long-term management programs for ACL injury.

The standard accepted practice for managing acute ACL injuries varied slightly from one country to another however, in Denmark, Sweden, the Netherlands and Norway, non-operative management for first six to 12 weeks is usual care, followed by a shared decision-making process to undertake an operative or non-operative management pathway. This is reflective of current world best practice. An operative pathway is generally recommended for people wishing to return to a pivoting sport, with operative rates in these countries at 50 per cent.

Standard accepted ACL injury management practice in Australia is early referral for a surgical reconstruction of the ACL. Our operative rates are 90 per cent, with 80 per cent of these performed in the private sector.

A lecture presentation combining contemporary research and expert clinicians' perspective from around the world will explore current world best practice of ACL injury management, individual considerations of non-operative and operative management pathways, prehabilitation programs, early, mid and late stage rehabilitation stages including return to sport considerations and ACL injury prevention programs.

## TRANSFORMING CARE FOR PEOPLE WITH KNEE AND HIP OSTEOARTHRITIS: THE ROLE OF PHYSIOTHERAPISTS

### Roos E

In many countries, total joint replacement is considered the gold standard treatment for people with pain and functional limitations from hip and knee osteoarthritis (OA). Research from the last few decades however challenges this view. Today, we know that only 15-20% who present at their GP have symptoms severe enough to warrant surgery. The evidence for non-surgical treatments provided by health practitioners other than medical doctors has increased and exercise therapy is the most effective non-surgical treatment for OA, especially when supervised by a physiotherapist. In parallel, passive treatments, also delivered by physiotherapists, have been shown to have no effect greater than placebo. The health care reimbursement systems, and maybe also the physiotherapy curriculums, lag behind and do not take this shift into account, contributing to patients with OA not receiving the evidence-based care universally recommended by clinical guidelines.

To help physiotherapists deliver the care recommended by clinical guidelines to people with OA we started the Good Life with Osteoarthritis in Denmark (GLA:D®) in 2013. The program, consisting of a 2-day

certification course for clinicians, treatment consisting of patient education and supervised group-based but individualized exercise therapy, and the collection of outcomes in an electronic registry, was an immediate success. Today more than 1000 physiotherapists have been trained in Denmark alone and the program is now available in Canada, Australia, China and Switzerland with New Zealand to follow in late 2019.

Key Practice Points:

- Highlights a model for how evidence-based care can be taught, implemented and evaluated by physiotherapists across private practice, community and hospital settings
- Increased awareness of the current evidence base for treatment of osteoarthritis

Our team's research investigating the drivers of evidence-to-policy and evidence-to-practice gaps in OA care, alongside developing options to facilitate physiotherapy-led high-value care provides important lessons on how we can bridge the current care disparity gaps for musculoskeletal conditions.

Key Practice Points:

- discuss health system strengthening for OA in Australia;
- describe initiatives to change health policy and services based on the implementation of models of care
- discuss physiotherapist-led initiatives to illustrate how clinical practice (what we do) can be changed by the implementation of research evidence (what we know).

## TIBIALIS POSTERIOR AND HIP MUSCLE FUNCTION IN TIBIALIS POSTERIOR TENDINOPATHY: A CROSS SECTIONAL STUDY

Ross M<sup>1</sup>

<sup>1</sup>University Of Queensland, St Lucia, Australia

Aim: To investigate tibialis posterior and proximal muscle function in individuals with tibialis posterior tendinopathy (TPT).

Design: Cross-sectional.

Methods: We compared 23 individuals with isolated TPT (age: 42±13; BMI: 27±7) to 27 asymptomatic controls (age: 43±16, BMI: 23±5). TPT diagnosis was made clinically; based on medial foot/ankle pain plus at least one of: tenderness on palpation, swelling of the tendon, pain/difficulty with resisted contraction or single leg heel raise (SLHR). Muscle force was measured with a fixed hand-held dynamometer for ankle plantarflexion-inversion (PF/INV) and for hip adductors/abductors, flexors/extensors and external/internal rotators. Hip muscle torque was calculated using force and distance from the axis of rotation. SLHR height and endurance and time to complete a stair task were assessed. Between group and side differences were explored using repeated-measures MANOVAs and pairwise comparisons (95% confidence interval (CI)).

Results: Compared to controls, hip extension torque ( $p=0.021$ ) and SLHR endurance ( $p<0.001$ ) were bilaterally lower in individuals with TPT. PF/INV force on the symptomatic side was lower than the asymptomatic side and controls ( $p<0.001$ ). Individuals with TPT took significantly longer to complete the stair task ( $p<0.001$ ).

Conclusions: Individuals with TPT have bilateral deficits in hip extensor torque and SLHR endurance and unilateral deficits in PF/INV force production. There is evidence of global functional impairment with a stairs task.

Key Practice Points:

- Assessment of muscle function in individuals with TPT should include the asymptomatic side

- SLHR endurance may need to be considered compared to population norms
- Hip extensor muscle strength might be a target for rehabilitation

## THE EXPERIENCES OF PHYSIOTHERAPY FOR INDIVIDUALS WHO IDENTIFY AS LGBTIQ+

**Ross M<sup>1</sup>**, Setchell J<sup>1</sup>

<sup>1</sup>*University Of Queensland, St Lucia, Australia*

**Aim:** To explore how individuals who identify as lesbian, gay, bisexual, transgender, intersex, queer or related identities (LGBTIQ+) experience physiotherapy in Australia to provide physiotherapists with the opportunity to improve (where required) the provision of care.

**Design:** Qualitative with small quantitative component.

**Method:** Individuals aged 18+, who self-identified as LGBTIQ+, and had attended physiotherapy were eligible to participate. Open responses were collected using a purpose-built online survey and analysed with thematic analysis. Descriptive statistics were used for quantitative responses.

**Results:** 114 participants responded to the survey, with 108 meeting eligibility criteria. Four main themes were identified. Almost all participants reported experiences during physiotherapy interactions relating to at least one of: 1) 'assumptions' about participants' sexuality or gender identity; 2) 'proximity/exposure of bodies' including discomfort about physical proximity, touch, undressing and/or observing the body; 3) 'discrimination' including overt as well as a fear of discrimination; and 4) 'lack of knowledge about transgender-specific health issues'. Positive encounters were also evident at times. A number of ways to improve LGBTIQ+ experiences with physiotherapy were supported including: diversity training, education specific to the LGBTIQ+ population, and open options for gender provided on forms.

**Conclusion:** People who identify as LGBTIQ+ experience challenges when attending physiotherapy and support a number of suggestions for improving physiotherapy across educational and clinical settings.

**Key Practice Points:**

- LGBTIQ+ individuals experience erroneous assumptions by physiotherapists, discomfort, explicit and implicit discrimination and a lack of knowledge specific to their health needs
- Diversity training, education specific to LGBTIQ+ health needs and open responses for gender on forms may improve provision of care

## THE AGEING WORKFORCE – CHALLENGES AND INTERVENTIONS

**Rothmore P<sup>1</sup>**

<sup>1</sup>*Faculty of Health and Medical Sciences, The University of Adelaide, Adelaide, Australia*

**Background:** The workforce is ageing. While those in relatively sedentary occupations may be largely unaffected, for those employed in more physically demanding occupations - and the organisations who employ them - this poses a challenge. While many organisations routinely conduct risk assessments of their physical and (less often) their psychosocial work environments these are seldom associated with outcome measures, which are relevant to their worker demographics, and on which they can develop and measure the effectiveness of any intervention.

**Objectives:** This presentation will outline the physical and cognitive changes experienced by older workers and provide suggestions for the development of interventions. The challenges of intervention-based research will be illustrated in a case study. This case study will describe the outcomes of a cross-sectional

survey of outdoor council workers in South Australia. In this study workers were surveyed using a participative hazard identified and risk management (APHIRM) toolkit and the Work Ability Index (WAI).

Results: Associations with WAI scores were found for age, pain and discomfort, perceptions of health and safety at work, as well as a range of psychosocial and physical risk factors. WAI scores were reduced by more than 2.5 points for those who reported higher levels of exposure to a range of physical and psychosocial risk factors compared with those who reported lower levels of exposure.

Key Practice Points:

- The ageing workforce has added an additional layer of complexity to the identification of workplace hazards and the development of interventions.
- The methods used in the case study provide a useful framework to identify and prioritise workplace hazards and inform the development of interventions to maintain a healthy, older workforce.

## ROBOTIC TECHNOLOGIES IN PAEDIATRIC REHABILITATION – EVIDENCE, CONTROVERSIES AND CLINICAL APPLICATION

Russo R<sup>1,2</sup>

<sup>1</sup>Women's and Children's Hospital Campus, North Adelaide, Australia, <sup>2</sup>Flinders University School of Medicine, Bedford Park, Australia

Robotic technologies are emerging as one method to assist the child and adolescent with neurological disability achieve higher functional abilities. The trend currently is away from robotic technologies used to assist those with disabilities overcome barriers in the environment, to now directly influencing functional ability in congenital disabling conditions and recovery after acquired disability.

This presentation is based on a review of the available literature, results of clinical practice and results of research projects currently underway examining the use of these technologies in youth with neurological disabilities.

The aim of this presentation is to review the current trends and controversies in the application of robotic technologies in the rehabilitation of children and adolescents with neurological disability.

The presentation will use the LokomatPro® and Armeo® robotic orthoses to illustrate major points.

Key Practice Points:

- To learn about the potential role of robotic technologies in assisting children and adolescents with significant disability make improvements in functional outcome.
- To appreciate how these technologies can complement evidence based treatments.
- To think critically about the strengths and weaknesses these technologies can have and to use this knowledge to assist in the rehabilitation of the children the audience/participants manage.

## FACTORS WHICH INFLUENCED THE RESPONSE TO HOSPITAL-BASED REHABILITATION TO IMPROVE WALKING IN OLDER ADULTS

**Said C<sup>1,2,3,4</sup>**, Bernhardt J<sup>4,5</sup>, McGinley J<sup>1</sup>, Szoek C<sup>6,7,8</sup>, Churilov L<sup>9,10</sup>, Woodward M<sup>11,12</sup>, Workman B<sup>13,14</sup>, Hill K<sup>15</sup>, Liew D<sup>16</sup>, Wittwer J<sup>4</sup>, Morris M<sup>4,17</sup>

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**Aim:** Explore factors associated with positive response to hospital-based rehabilitation in older people.

**Design:** Secondary data analysis from a multisite randomized controlled trial.

**Method:** Older people (n= 198, median age 80.9 years, IQR 76.6- 87.2) undergoing inpatient geriatric rehabilitation were recruited. Participants received multidisciplinary care and were randomised to receive additional daily physiotherapy focused on mobility (n = 99), or additional social activities (n = 99). Self-selected gait speed was measured at baseline and discharge; changes  $\geq 0.1$  m/s classified 'responders' (n = 130) and changes  $< 0.1$  m/s classified 'non-responders' (n = 64). Multivariate logistic regression explored the impact of five participant factors and three therapy factors on rehabilitation response.

**Results:** Baseline characteristics demonstrated this group had complex health issues. Age showed excessive collinearity and was removed from analysis. Patient factors including baseline mobility status, frailty, cognition and depression did not impact odds of responding. Therapy factors including additional socialization (OR 3.23 95% CI 1.18 to 8.80; p = .022); increased supervised upright physical activity time per day (OR 1.04; 95 % CI 1.01 to 1.08; p = .021) and more days in rehabilitation (OR 1.03; 95% CI 1.00 to 1.08; p = .034) increased odds of responding.

**Conclusion:** Within this cohort, therapy factors increased odds of positive improvement in walking. While mechanisms are unclear, social engagement may be important during inpatient rehabilitation.

### Key Practice Points:

- In older people, identifying who will achieve meaningful improvements in gait with inpatient rehabilitation is difficult.
- Social engagement may impact rehabilitation outcomes in this cohort.

**Proposed impact, on health outcomes of Aboriginal and Torres Strait Islander people:** Results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population compared to non-Indigenous population.

LaTrobe University, Austin Health, and Monash Health Human Ethics Committees approved this study



## FEASIBILITY OF RECUMBENT BIKE RIDING IN PEOPLE WITH FRACTURED HIP: A PILOT RANDOMIZED CONTROLLED TRIAL

**Said C<sup>1,2,3</sup>**, Delahunt M<sup>3</sup>, Hardidge A<sup>4</sup>, Smith P<sup>3</sup>, McDonald L<sup>3</sup>, Kefalianos E<sup>2</sup>, Tran P<sup>5</sup>, Berney S<sup>3</sup>

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**Aim:** To demonstrate the feasibility of a trial protocol designed to determine the effect of early post-operative cycling in bed on outcomes in people with hip fracture.

**Design:** Single-blinded, multi-site randomized controlled pilot trial.

**Method:** Fifty-one people with hip fracture were recruited within 4 days of surgery from two sites in Victoria. Participants were randomly allocated to receive either usual care (n = 25) or usual care plus active cycling in bed (n=26). The intervention was delivered on weekdays until the participant could walk 15 m with assistance of one person. The primary outcomes were trial feasibility and safety. Clinical outcomes, including mobility (Modified Iowa Level of Assistance Scale) and delirium were measured seven days post-operatively and at hospital discharge by an assessor blinded to group. Additional outcomes at discharge included gait speed, cognition and quality of life.

**Results:** The intervention was safe and feasible, with 75% of scheduled sessions delivered. The trial protocol was feasible, however 50% of participants had not completed the intervention by seven days post-operatively.

**Conclusion:** In bed cycling is feasible post-operatively following hip fracture, however seven days post-operatively is too early to measure the impact of the intervention. A fully powered RCT to explore the effectiveness and cost efficiency of this novel intervention is warranted.

**Key Practice Points:**

- Cycling in bed is feasible and safe for people in the early post-operative period following hip fracture.
- Further studies are required to determine whether cycling in bed improves outcomes.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population compared to the non-Indigenous population.

Austin Health Human Ethics Committee approved this study

## APPEARANCE-BASED OR HEALTH-BASED MESSAGE FRAMING: WHAT MOTIVATES PHYSICAL ACTIVITY PARTICIPATION?

**Saken M<sup>1</sup>**, Williams J<sup>1</sup>, Canetti E<sup>1</sup>, Hing W<sup>1</sup>, Gough S<sup>1</sup>

<sup>1</sup>Bond University, Robina, Australia

**Aim:** To explore which factors may influence physical activity participation and whether message framing may influence motivation to participate in physical activity.

**Design:** Usability study with a self-reported electronic questionnaire.

**Method:** The questionnaire consisted of seven sections: demographics, Godin Leisure Time Exercise Questionnaire, exercise prevention, exercise motivation, message framing, message perception and a manipulation check. Two hundred thirteen respondents consisting of 51 (23.9%) males and 161 (75.6%) females between 19 and 76 years old (mean = 38.8 years) recruited by email or social media completed the 28-item online questionnaire.

**Results:** A positive health-based message was most likely to motivate physical activity participation, whilst a negative appearance-based message was least likely to motivate. Barriers to physical activity participation included lack of time, injury, soreness/fatigue and weather, while motivators included health, enjoyment, appearance and social interaction. The manipulation checks revealed many respondents correctly identified the message framing option as health/appearance and positive/negative (90.1- 98.6%).

**Conclusion:** This study highlights the importance of message framing to influence motivation to physical activity participation. A positive health-based message was most likely to motivate physical activity participation, whilst negative appearance-based message was least likely to motivate.

**Key Practice Points:**

- A positive health-based message is most motivating for physical activity participation
- A negative appearance-based message is least motivating for physical activity participation
- Lack of time is the main barrier to physical activity

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** This study is not specific to Aboriginals or Torres Strait Islanders, however it provides insight into message framing to increase exercise participation along with common motivators and barriers to physical activity participation.

## CORRELATION BETWEEN PERCEIVED SPUTUM EXPECTORATION AND MEASURED WET WEIGHT OF SPUTUM

**Santos M<sup>1</sup>**, Milross M<sup>2</sup>, McKenzie D<sup>3</sup>, Alison J<sup>2,4</sup>

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**Aim:** To determine the correlation between participants' perceived amount of sputum expectorated and wet weight of sputum collected with three secretion clearance interventions.

**Design:** Prospective, randomised cross-over trial.

**Method:** Within a 10-day period, adult participants with stable bronchiectasis performed three interventions (bubble-positive expiratory pressure (PEP), active cycle of breathing technique (ACBT) and Control) in random order for 30-minutes whilst sitting. Sputum expectorated throughout the 30-minute intervention was collected, and the wet weight measured with a precision laboratory digital scale at end of each intervention. Participants were asked to rate their perceived sputum production immediately after each 30-minute intervention on a 0 to 100 mm visual analogue scale (VAS).

**Results:** 35 participants were recruited and 34 completed the study. There was a moderate correlation between participants' VAS and measured sputum wet weight for bubble-PEP ( $r = 0.57$ ,  $p < 0.01$ ), ACBT ( $r = 0.54$ ,  $p < 0.01$ ) and Control ( $r = 0.57$ ,  $p < 0.01$ ) interventions.

Conclusion: Participants' perception of sputum expectorated had a moderate correlation with the amount of wet weight of sputum measured.

Key-Practice-Points:

- The perceived amount of sputum expectorated by people with bronchiectasis may be a reasonable reflection of the actual amount as measured via a digital scale.
- Subjective and objective measures of sputum expectoration could reflect the effectiveness of physiotherapy interventions in clearing secretions from the airways.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The perceived amount of sputum expectorated with physiotherapy interventions could be a useful indicator of the effectiveness of the intervention in clearing secretions from the airways in Aboriginal and Torres Strait Islander people with bronchiectasis.

## LOW-FIDELITY SIMULATION TRAINING IMPROVES CONFIDENCE AND COMPETENCY IN NEW PHYSIOTHERAPY GRADUATES

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<sup>1</sup>Physiotherapy Department, Prince of Wales Hospital, Randwick, Australia

Aim: To determine if low-fidelity simulation training improves confidence and competency in new physiotherapy graduates undertaking cardiorespiratory physiotherapy tasks in a large tertiary adult hospital.

Design: Pre and post training survey.

Method: Newly graduated physiotherapists undertook low-fidelity simulation training of cardiorespiratory physiotherapy tasks which included suctioning, manual assisted cough, use of a cough-assist machine and spirometry. A survey with a 5-point Likert scale (ranging from 1 unit (poor/not at all) to 5 units (extremely)) was administered pre and post training to evaluate participants' perception of confidence and competency of tasks undertaken.

Results: 10 participants completed training. Low-fidelity simulation training improved confidence with open-suction (mean difference [95% CI] (1.0 unit [0.7 to 1.3])); guedel-suction (0.9 units [0.5 to 1.3]); nasopharyngeal-suction (0.9 units [0.7 to 1.1]); manual assisted cough (0.9 units [0.4 to 1.4]); use of cough-assist machine (1.1 units [0.4 to 1.8]); spirometry (0.9 units [0.5 to 1.3]). Low-fidelity simulation training also improved competency with open-suction (1.2 units [0.6 to 1.7]); guedel-suction (1.1 units [0.4 to 1.7]); nasopharyngeal-suction (1.3 units [0.7 to 1.8]); manual assisted cough (1.5 units [0.8 to 2.1]); use of cough-assist machine (1.3 units [0.7 to 1.9]) and spirometry (1.1 units [0.7 to 1.5]).

Conclusion: Low-fidelity simulation training significantly improved confidence and competency with cardiorespiratory tasks in newly graduated physiotherapists.

Key Practice Points:

- Low-fidelity simulation training allows for practice of techniques and skills in a controlled and safe environment where real patients are not required.
- Low-fidelity simulation training can improve confidence and competency when performing unfamiliar tasks.

## A PEDALLING-BASED PROTOCOL WAS SUPERIOR TO STANDARD PHYSIOTHERAPY FOR POST-OPERATIVE REHABILITATION AFTER TOTAL KNEE REPLACEMENT IN A RANDOMISED CONTROLLED TRIAL

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<sup>1</sup>Bond University, Robina, Australia, <sup>2</sup>Pindara Private Hospital, Benowa, Australia, <sup>3</sup>Knee Research Australia, Benowa, Australia

**Aim:** To determine if a self-directed pedalling protocol following total knee replacement surgery was superior to standard multi-exercise non-pedalling physiotherapy.

**Design:** Randomised controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

**Method:** Sixty TKR patients were randomized to receive postoperative physiotherapy involving either a 3-exercise pedalling-based (3-Ex-Pedal-Group) or a standard 10-exercise, non-pedalling protocol (10-Ex-NonPedal-Group). Outcomes were assessed at 2 days, 2 weeks, and 4 months, and included tests of function, patient-reported outcomes, and other perioperative measures.

**Results:** For the primary outcome, the 6-minute walk test, distance walked was further in the 3-Ex-Pedal-Group at 2 days ( $p = 0.001$ ). The 10-m walk (10MWT) and the Timed Up & Go (TUG) tests, were faster for the 3-Ex-Pedal-Group at 2 days ( $p = 0.016$ ,  $p = 0.020$ ). Oxford Knee Scores were better in the 3-Ex-Pedal-Group at 2 days ( $p = 0.034$ ) and at 2 weeks ( $p = 0.007$ ), as was the EQ-5D score at 2 weeks ( $p = 0.037$ ). The EQ-5D-VAS was better for the 3-Ex-Pedal-Group at all three time points ( $p = 0.031$ ,  $p = 0.050$ , and  $p = 0.044$ ). Length of stay was shorter, by a half-day, for the 3-Ex-Pedal-Group ( $p = 0.024$ ). The 10-Ex-Nonpedal-Group was not superior for any outcome at any time point.

**Conclusion:** A pedalling-based protocol after TKR was superior to a standard multi-exercise physiotherapy protocol with these benefits decreasing over time.

**Key Practice Points:**

- An inexpensive and self-directed pedalling protocol is superior for patients than standard multi-exercise physiotherapy following total knee replacement surgery.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:**

As pedalling on a simple set of floor pedals is relatively inexpensive and can be done as a self-directed home program it would be an easily adopted protocol for those living in regional or remote areas.

## HOW OSTEOARTHRITIS CHANGES KNEE KINEMATICS.

Galvin C<sup>1,2</sup>, Perriman D<sup>1,2,3</sup>, Pickering M<sup>4</sup>, Lynch J<sup>2,3</sup>, Smith P<sup>2,3</sup>, **Scarvell J<sup>1,2</sup>**

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**Aim:** This research aims to compare the difference in kneeling kinematics in six-degrees-of-freedom for people with knee osteoarthritis.

**Design:** Cross-sectional observational study.

**Method:** We recruited 44 healthy and 56 knee-osteoarthritis participants matched for age (>50 years) and gender. Each participant's knee CT scan was registered to fluoroscopy of kneeling using a bespoke 3D-2D registration algorithm—producing knee motion in 3D. Kinematic features including 3 translations and 3 rotations were analysed, for position, displacement and rate-of change, using MANCOVA controlled for BMI.

**Results:** Groups were matched for age and gender, but the OA group had higher body mass index. Moving into flexion: osteoarthritic knees had  $-12.8^\circ$  (95% CI:  $-17.0^\circ$  to  $-8.6^\circ$ ) less maximum flexion, tibias internally rotated earlier and were  $-4.6^\circ$  ( $-7.7^\circ$  to  $-1.4^\circ$ ) more rotated at  $120^\circ$  flexion. Femurs rolled back less, at maximum flexion were 8.3 (5.0, 11.5) mm more anterior and 4.0 (1.6 to 6.2) mm more medial. Over flexion range  $120^\circ$ -maximum flexion, osteoarthritic femurs translated 5.8 (2.8 to 8.9) mm less posteriorly and 1.3 (0.6 to 2.1) mm more superiorly.

**Conclusion:** Knees with osteoarthritis have reduced flexion, reduced femoral roll back and internally rotate earlier. These kinematics are related, since femoral rollback and rotation is integral to allowing flexion.

**Key Practice Points:**

- Knees with osteoarthritis have reduced flexion and less femur roll-back.
- Since femur roll-back and rotation are integral to knee flexion, there may be an opportunity to intervene by improving roll back.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: There is no specific impact.

## DIFFERENCES BETWEEN NOVICE AND EXPERT PERFORMANCE IN DEFENSIVE TACTICS EMPLOYED BY POLICE OFFICERS

Schippers E<sup>2</sup>, Orr R<sup>1,2</sup>, Schram B<sup>1,2</sup>, Lockie R<sup>3</sup>, Holmes R<sup>4</sup>, Kornhuaser C<sup>4</sup>, Dawes J<sup>5</sup>

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**Aim:** To compare experts and novice law enforcement officers in defensive skill execution, using the Defensive Tactics and Arrest Control (DETAC) gauntlet.

**Design:** A retrospective cohort study.

**Method:** Data for 15 police DETAC instructors (age =  $31.93 \pm 6.98$  yrs; height =  $194.02 \pm 17.03$  cm; mass =  $87.55 \pm 12.25$  kg) and 36 general duties officers (age =  $39.67 \pm 8.32$  yrs; height =  $186.40 \pm 14.59$  cm; mass =  $89.62 \pm 13.90$  kg) completed DETAC training. Four DETAC subject matter experts evaluated police officers' ability to execute the techniques as trained, and their physical ability to perform each defensive skill. Defensive skills included edged weapon disarm (EWD), holstered gun retention (HGR), blunt object defence (BOD), gun disarm (GD) and prone handcuffing (PH).

**Results:** Instructors outperformed ( $p < .001$ ) general officers in 'techniques-as-trained' in all five techniques and in 'physical-ability-to-perform' for EWD ( $p < .001$ ), HGR ( $p < .001$ ) and GD ( $p < .05$ ).

**Conclusion:** Police training and physical assault are leading cause of police officer injuries. Police officers with higher levels of skill can perform DETAC skills more effectively and typically more physically efficiently, thus reducing their risk for movement error, and injury to themselves, other officers undergoing training and offenders.

Key Practice Points:

- Investment in the development and maintenance of instructor-level DEFTAC skill, especially where physical capability is required, may lead to an increase in general duties officer effectiveness in DEFTAC performance and decrease their risk of physical injury when restraining an offender.
- After periods of prolonged recovery (e.g. following serious injury), DEFTAC skills may have degraded and need to be retrained prior to full return-to-duty

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population above that of the non-Indigenous population

## RISK FACTORS FOR DEVELOPMENT OF LOWER LIMB OSTEOARTHRITIS IN PHYSICALLY-DEMANDING OCCUPATIONS LIKE THE MILITARY: A NARRATIVE UMBRELLA REVIEW

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Aim: To identify and synthesise key findings from previous literature reviews that have examined risk factors for development of lower limb OA in physically-demanding occupations.

Design: A narrative umbrella review

Method: A systematic search was conducted to identify literature reviews examining associations between lower limb OA and occupational tasks. Methodological quality was rated with a Measurement Tool to Assess Systematic Reviews (AMSTAR) 2 before key data were extracted and synthesised.

Results: Sixteen reviews were found (knee = seven, hip = four, hip and knee = three, various joints = two) and based on AMSTAR 2, one review was of high methodological quality, one of critically low methodological quality and the others of moderate methodological quality. The selected reviews found moderate to good evidence that heavy occupational lifting (range 10-50kg) was associated with an increased risk of OA at the knee and the hip. Other occupational tasks that may increase the risk of lower limb OA included kneeling, squatting and climbing with previous injuries to joints and overweight and obesity also predictive of lower limb OA.

Conclusion: These tasks and joint injuries are common in military personnel; therefore, it is not, surprising that they experience greater rates of OA than the general population. Efforts to reduce exposure to these tasks, reducing joint injuries, ensuring optimal bodyweight and full rehabilitation of injuries may reduce risks of lower limb OA. Further research is needed to test these interventions.

Key Practice Points:

- This study highlights the potential of the development of lower limb OA in physically demanding jobs.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Aboriginal and Torres Strait Islander people who work in occupations which require heavy lifting, kneeling, squatting or climbing may be at an increased risk of lower limb OA.

## A PROFILE OF KNEE INJURIES SUFFERED BY AUSTRALIAN ARMY RESERVE SOLDIERS

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**Aim:** The purpose of this study was to profile the leading body site of injury occurring in part-time soldiers to inform injury prevention strategies.

**Design:** A Retrospective Cohort Study

**Method:** Injury data of Australian Army Reserve (ARES) soldiers spanning a two-year period were obtained from the Department of Defence Workplace Health, Safety, Compensation and Reporting database. Data included location, nature, mechanism and the activity being performed at the time of injury.

**Results:** Among the 1434 injuries reported by ARES personnel, the knee was the most common injury site (n = 228, 16%). Soft tissue injury due to trauma or unknown causes was the most common nature of knee injury (n = 177, 78%). Combat training was the most common activity being performed when soft tissue injuries occurred at the knee (n = 73, 42%), with physical training the second most common (n = 51, 30%), due to muscular stress (n = 36, 71%) and falls (n = 8, 16%).

**Conclusion:** Targeted intrinsic and extrinsic approaches to injury minimization strategies for soft tissue knee injuries during combat and physical training should be designed. ARES personnel appear to be injured at a higher rate in combat training than their full-time colleagues, possibly due to less exposure and ability to participate in combat training.

**Key Practice Points:**

- Efforts should be made to reduce soft tissue injuries around the knee in reserve personnel.
- Strategies to expose ARES personnel to combat training need to be developed.

**Proposed impact,** if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Aboriginal and Torres Strait Islander people who are enlisted as reservists may benefit from interventions targeted at reducing soft tissue injuries to the knee during combat training and physical training.

## PROFILING THE INJURIES SUSTAINED BY RECRUITS DURING POLICE FORCE RECRUIT TRAINING

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**Aim:** The aim of this study was to profile injuries occurring within a national police force during initial training to inform injury prevention strategies.

**Design:** A retrospective cohort study.

**Method:** Data pertaining to injuries suffered during a 22-month training period at a national police college were received. Injury data included location, nature, mechanism and the activity being performed when the injury was suffered.



Results: A total of 564 injuries were recorded over the 22-month period, with the mean age of recruits reporting an injury being 28.83 years  $\pm$  6.9 years. The incidence of injuries ranged from 456.25 to 3079 injuries per 1000 person-years with an overall incidence rate of 1550.15 injuries per 1000 person-years overall. The shoulder was the most commonly injured site (n=113, 20% of injuries), with sprains and strains being the most common nature of injury (n=287, 50.9% of injuries). Muscular stress with physical exercise was the most common mechanism of injury (n=175, 31.0% of injuries) with the activity responsible for the majority of injuries occurring during an 'unknown' (n=256, 25.4% of injuries) followed by police training (n=215 (38.1%).

Conclusion: Injuries appear to be joint related and common to the shoulder with police training being a primary known activity at the time of injury.

Key Practice Points:

- Injury minimization programs (e.g. pre-screening protocols) should target the shoulder prior to police training activities.
- Injuries, especially to the shoulder, that occurred pre-enlistment or during training must be fully rehabilitated prior to trainee return-to-training and commencement as a qualified officer.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population above that of the non-Indigenous population

## MUSCULAR FITNESS: IT'S TIME FOR A JUMP START! 2018 ACTIVE HEALTHY KIDS AUSTRALIA REPORT CARD ON PHYSICAL ACTIVITY FOR CHILDREN AND YOUNG PEOPLE

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The Active Healthy Kids Australia (AHKA) Report Card on Physical Activity for Children and Young People is a translation of knowledge that synthesises the best available evidence from around the country with regards to the:

- 1) Physical activity behaviours of Australian children and young people;
- 2) Settings and sources of influence that impact on physical activity behaviours; and
- 3) Traits that impact on or that are impacted by physical activity participation.

This presentation will highlight the key findings of the 2018 Report Card with a specific focus on muscular fitness and movement skills, show how Australia compares compared to the rest of the world as a member of the Active Healthy Kids Global Alliance.

Key Practice Points:

- Prevalence of adequate muscular fitness levels and movement skill competency amongst Australian children.
- Ways in which we can be addressing poor levels of fitness and movement skill competency within practice and as a whole of society.

## STRESS AND ARTHRITIS: A SCOPING REVIEW

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**Aim:** A growing body of research supports the role of chronic stress in development of chronic diseases. This review aimed to map the field of research exploring relationships between chronic stress and arthritis onset.

**Design:** Scoping review of peer-reviewed studies investigating links between chronic stress and arthritis onset, using Arksey and O'Malley's (2005) methodological framework.

**Method:** Five electronic databases were systematically searched and two reviewers independently performed each step of study selection and data extraction. Data were narratively synthesised to provide an overview of the research field.

**Results:** Fifty-eight studies met inclusion criteria; 48 used quantitative methods, 9 used qualitative methods and 1 used mixed methods. Studies increased chronologically, with nearly half (n=27) published in the last 10 years. Measurement of stress exposures and arthritis outcomes varied considerably between studies. All except three studies used self-reported stress measures. Self-reported arthritis was the most common outcome measured. A majority (n=45) of study findings suggested a relationship between stress and arthritis onset.

**Conclusion:** The increase in study numbers in the last decade reflects an increasing awareness of the potential impact of chronic stress in arthritis development. This is consistent with a biopsychosocial approach and consideration of social determinants of health in the conceptualisation of chronic disease aetiology. Greater specificity in arthritis measurement, as well as objective stress measures, are required to establish a clear causal relationship.

**Key Practice Points:**

- Chronic stress may be related to arthritis onset.
- Arthritis development should be considered in the context of a broader biopsychosocial framework.

## TRANSFORMING THE CLINICAL EDUCATION LANDSCAPE: LONG-TERM PHYSIOTHERAPY PLACEMENTS IN A RURAL AREA

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**Aim:** To discuss strategies for establishing a full-year physiotherapy placement program in Coffs Harbour NSW.

**Design:** The current critical shortage of quality clinical placements for physiotherapy students necessitates an exploration of placement opportunities. This descriptive paper details the process of establishing this program and an examination of the quantity and quality of student placements.

Method: A Content, Input, Process, and Product analysis of the program was conducted. Student evaluation and placement data informed the analysis and was included in a critical reflection establishment of the program.

Results: Students undertaking the long-term program in Coffs Harbour have increased from four students completing a semester in 2018 to four students completing a full year in 2019. Students indicated that the supported nature of the placements, having the majority of their placement in one location and the additional learning activities facilitated by local academics are invaluable learning experiences. Clinical supervisors have indicated that having the students immersed in the local community and the local health services is beneficial and makes it easier to take placements.

Conclusion: This unique model of clinical placement has proved mutually beneficial for the students, the physiotherapists, the health service, the community and the university. In-particular students are able to experience living and working rurally and this may consider rural practice on graduation.

Key Practice Points:

- This model of long-term placement for physiotherapy students has successfully increased the quality and quantity of clinical placements in a rural setting.

## EXERCISE PRESCRIPTION IN PULMONARY HYPERTENSION: WHAT ARE WE UP TO?

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Background and Aim: The growth in the number of exercise training studies in pulmonary hypertension (PH) over the past 20 years has broadened our understanding on exercise prescription. Whilst the evidence base remains relatively narrow, studies to date have used a range of exercise prescriptions in PH. We have also implemented an exercise program in PH using an optimised exercise prescription(1). The aim of this presentation is to review the exercise prescription in PH studies conducted to date and to present some of the training data from our training study(1).

Design and Methods: Primary published studies of exercise training in pulmonary hypertension, including both controlled and non-controlled studies, were included. Where possible, exercise prescription data ie duration(weeks), mode, frequency, intensity and duration(minutes) were extracted.

Results: Data was extracted from 15 studies. Duration ranged from 3-15 weeks from both inpatient and outpatient settings. The primary mode of training was lower limb exercise consisting of either cycling or walking. Some studies included upper limb exercise whilst others combined lower limb training with strengthening. Training frequency ranged from daily(inpatient programs) to twice weekly (outpatient). Intensity was set using either a percentage of peak heart rate or a percentage of maximal power or six minute walking speed (6MWS). The duration ranged from 90 minutes(inpatient) to 30 minutes(outpatient). In our study(1), participants train twice weekly for 40 minutes (20 minutes cycle/20 minutes treadmill) for 8 wk. Intensity is titrated up from an initial 60% peak power cycling and 60% of 6MWS walking. An upper limit of 85% peak HR, 4 (modified BORG) and 85% oxygen saturation is used.

Conclusion and Practice Points:

- To date, the exercise prescription applied for PH has been similar to that implemented in chronic heart and lung disease exercise-based rehabilitation programs.

References:

1. Morris et al (2018). BMC Pulmonary Medicine(2018)18:40.

## STATE OF CLINICAL PAIN RESEARCH IN NEPAL: A SYSTEMATIC SCOPING REVIEW

Sharma S<sup>1,2</sup>, Jensen M<sup>3</sup>, Pathak A<sup>2</sup>, Sharma S<sup>4</sup>, Pokharel M<sup>5</sup>, Abbott J<sup>2</sup>

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**Aims:** We aimed to: (1) identify and describe the extent and nature of pain research performed in Nepal, (2) identify existing knowledge and significant knowledge gaps, and (3) provide recommendations for future studies.

**Design:** A systematic scoping review published from inception to November 2018.

**Methods:** Six databases (local and international) were search to identify research conducted in Nepal on individuals a diagnosis of a clinical pain condition. Two reviewers screened the studies for inclusion.

**Results:** We identified 1396 records and included 116 studies. The majority of studies were published in local Nepalese journals (75%) and were conducted in clinical settings (73%). Post-surgical pain was the most commonly studied pain condition (33%), followed by musculoskeletal pain (16%), headache (14%), and low back pain (13%). The most popular theme identified was medical management of pain (40%), followed prevalence/incidence studies (21%), diagnostic studies (15%), and surgical management and patient-reported outcome measurement studies (8% each). The majority of studies focused on diagnosis and treatment of “biological” component of pain conditions. Research gaps and potential areas of resource waste were identified including significant problems of overdiagnosis (e.g., imaging for non-specific pain conditions when they are not indicated) and overtreatment (e.g., injections and surgeries when not indicated). Only one population level study on headache was retrieved. Research priorities identified were: population level studies on other pain conditions, pain in vulnerable patients, pain in children, cancer pain, and comprehensive biopsychosocial management of pain.

**Conclusions:** Although significant number of pain research papers were published, the majority of research focused on biomedical diagnosis and management of pain. The findings may inform future research directions and maximizing the knowledge that could be gained.

**Key practical points:**

- Research knowledge gap is identified.
- Recommendations for clinical practice and future research are provided.

## CULTURAL DIFFERENCES IN PAIN-RELATED BELIEFS, COPING, AND CATASTROPHIZING IN CHRONIC PAIN: A SYSTEMATIC REVIEW

Sharma S<sup>1,2</sup>, Ferreira-Valente A<sup>3</sup>, Williams A<sup>4</sup>, Abbott J<sup>2</sup>, Pais-Ribeiro J<sup>3</sup>, Jensen M<sup>5</sup>

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**Aim:** To evaluate the extent to which pain-related beliefs, appraisals, coping, and catastrophizing differ as a function of culture.

**Design:** Systematic review of literature.

**Methods:** Two independent reviewers searched 15 databases (including grey literature) on 15 January 2019 without restriction for date or language of publication. Studies comparing pain beliefs/appraisals, coping, or catastrophizing across two or more cultures in adults with chronic pain (pain lasting for three months or more) were included. Two independent reviewers extracted data and performed the quality appraisal of included studies. Effect sizes were reported as small, medium or large (0.20-0.49, 0.50-0.79,  $\geq 0.80$  respectively). Study quality was rated as low, moderate, or high using a 10-item modified STROBE checklist.

**Results:** We retrieved 1365 articles and read 42 potential full-texts. Ten studies met the inclusion criteria. A total of 6,797 adults with chronic pain (33% with chronic low back pain) were included, from 16 countries. A total of 95 effect sizes were computed. Of these, 26 of 42 effect sizes (62%; 8 large, 8 medium, and 10 small) for pain beliefs/appraisal, 38 of 63 effect sizes (60%; 8 large, 13 medium, and 17 small) for pain coping, and 3 of 6 effect sizes (50%; 2 medium, 1 small) for pain catastrophizing were statistically significant.

**Conclusions:** In 50% or more of the studies, measures of pain beliefs and appraisals, coping responses, and catastrophizing were significantly different between cultures.

**Key Practice Points:**

- This review provides recommendations for future studies that help make meaningful cross-cultural comparison of chronic pain ultimately informing clinical practice.

## "TREATING EVERYONE THE SAME IS JUST NOT ENOUGH": LGBTIQA+ HEALTH LITERACY AMONG PHYSIOTHERAPY STUDENTS

Sharp M<sup>1</sup>

<sup>1</sup>University Of Melbourne, Parkville, Australia

**Aim:** To establish a best-practice, evidence-based framework for integrating LGBTIQA+ health literacy into Australian physiotherapy curriculum.

**Design:** A review of research conducted nationally and internationally designing, implementing and evaluating LGBTIQA+ inclusive curriculum.

**Method:** The study involved a scoping review of literature including empirical research conducted in the Global North where gaps in curriculum for LGBTIQA+ patients, students and educators were being identified, addressed or evaluated.

**Results:** The search yielded 127 items, 60 of which were included in the review for their applicability to tertiary education settings and their relevance to medical and science fields. Overwhelmingly, the research suggests that most changes to curriculum are initiated from a grass-roots orientation, usually instigated by students themselves. Attempts to include LGBTIQA+ health issues in curriculums were well received providing educators had been given awareness training. LGBTIQA+ inclusion was more successful when it was integrated into the curriculum, rather than being a stand-alone subject or module.

**Conclusion:** LGBTIQA+ inclusivity is perceived as health literacy by the student body, and generates greater interest in intersectional models of cultural competency. High quality evidence is needed in emerging areas of practice.

**Key Practice Points:**

- LGBTIQA+ people want to see visible markers of inclusion in health settings
- Physiotherapy students want to be given language and consent tools which are specific to LGBTIQA+ patients

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: LGBTIQ+ Aboriginal and Torres Strait Islander people face multiple intersecting marginalisation in health care settings. Increasing knowledge of these intersections will help emerging practitioners consider cultural competent models more broadly.

## RED FLAG PREVALENCE AND IMPLICATIONS FOR BACK PAIN PRESENTATIONS TO THE EMERGENCY DEPARTMENT

**Shaw B<sup>1</sup>**, Kinsella R<sup>1,2</sup>, Henschke N<sup>3</sup>, Walby A<sup>4</sup>, Cowan S<sup>2,5,6</sup>

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**Aim:** To contribute to the evidence regarding the utility of red flag screening for detection of serious underlying pathology in patients presenting with back pain to the Emergency Department.

**Design:** This retrospective observational study evaluated consecutive patients presenting with back pain to a Melbourne hospital Emergency Department to determine the prevalence, utility and diagnostic accuracy of red flags for serious pathology.

**Method:** A red flag definition checklist and diagnostic groupings were developed. Data pertaining to red flags and ED-initiated investigations were extracted and analysed from the electronic medical record of 1000 Emergency Department presentations.

**Results:** One or more red flags were reported by 69% of the cohort. Diagnostic groups included: musculoskeletal spinal (73.7%), serious spinal (3.3%), and serious non-spinal (14.6%). Logistical regression determined the accuracy of red flags to predict serious diagnoses. Those with a positive likelihood ratio (LR) of over five ( $LR > 5$ ) for any serious diagnosis (spinal/non-spinal) were flank pain, urinary symptoms, unexplained weight loss, known nephrolithiasis/AAA, history of tuberculosis, writhing in pain, and fever on examination. For serious spinal diagnoses, red flags with a  $LR > 5$  were saddle anaesthesia, acute-onset urinary retention, history of tuberculosis and intravenous drug-use.

**Conclusions:** Whilst most of the cohort in this study had back pain of benign cause, certain red flags were associated with greater probability of serious diagnosis.

### Key Practice Points:

- Physiotherapists should consider serious spinal and non-spinal causes of back pain
- Red flags should be clearly defined and understood
- Certain red flags increase the likelihood of serious pathology being found

Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander peoples: It is not expected that this study will have a specific effect on the Aboriginal and Torres Strait Islander community

## MEASUREMENT OF VAGINAL AND INTRA-ABDOMINAL PRESSURES DURING EXERCISE USING AN INTRA-VAGINAL PRESSURE DEVICE

**Sherburn M<sup>1</sup>**, Kruger J<sup>2</sup>, Budgett D<sup>2</sup>

<sup>1</sup>The University Of Melbourne, Parkville, Australia, <sup>2</sup>Auckland Bioengineering Institute, University of Auckland, Auckland, New Zealand, <sup>3</sup>Auckland Bioengineering Institute, University of Auckland, Auckland, New Zealand

**Aims:** To measure change in vaginal and intra-abdominal pressures simultaneously across a range of exercises, using a novel, wireless, intra-vaginal pressure sensor to answer the research question: 'What pressure changes occur when performing 'pelvic floor safe' versus 'conventional' exercise?'

**Design:** Observational experimental study, repeated-measures design.

**Methods:** Thirty consenting non-pregnant healthy women over 18 years with no symptoms of prolapse or incontinence performed nine pairs of 'pelvic floor safe' and 'conventional' exercises. Each participant inserted the vaginal device, then performed five repetitions of each exercise and one minute each of cycling and running. Pressure data was wirelessly transmitted to a tablet in real time then uploaded to a secure server. Abdominal and pelvic floor muscle pressures were measured individually for each exercise. Data was initially examined using automated methods, then a linear mixed model was fitted and multiple pairwise comparisons between pelvic floor muscle and abdominal pressures for each pair of exercises were explored.

**Results:** The only exercise which demonstrated significant differences between pelvic floor muscle and abdominal pressure was push-ups. Pelvic floor muscle pressures during wall push-ups were 0.24 to 0.71 times smaller than full push-ups ( $p < 0.01$ ). For running versus walking, abdominal pressure was 40% higher and pelvic floor muscle pressure 32% higher during running.

**Conclusion:** Although individual performance of these exercises varied, pelvic floor muscle and abdominal pressures were similar between most 'conventional' and 'pelvic floor safe' versions in this study.

**Key Practice Point:**

- Some 'pelvic floor safe' exercises may need to be reviewed.

## PHYSICAL ACTIVITY FOR OLDER ADULTS: EVIDENCE UPDATE

**Sherrington C<sup>1</sup>**

<sup>1</sup>University of Sydney, Sydney, Australia

There is extensive evidence of the health benefits of being physically active for people of all ages, including older adults. Exercise is a subset of physical activity that has particular benefits for the prevention of falls and the enhancement of physical functioning in older adults. This presentation will overview the current best evidence in the prescription of physical activity for older adults with a focus on exercise that enhances balance and strength. Examples of programs found to be effective in trials and systematic reviews will be given and the importance of behaviour change will be emphasised. The crucial role that physiotherapists can play in the enhancing physical activity in older adults in a range of settings will be highlighted.

**Key Practice Points:**

- This presentation aims to give attendees an update on the evidence to guide physical activity prescription for older adults as well as practical strategies they can use in their daily work.



## THE DEVELOPMENT AND NATIONAL ROLL-OUT OF ACCREDITED TRAINING TO SUPPORT THE IMPLEMENTATION OF AN EVIDENCE-BASED INTERVENTION: THE ESCAPE-PAIN TRAINING PROGRAMME

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<sup>1</sup>Health Innovation Network, London, United Kingdom, <sup>2</sup>Kingston University and St George's, University of London, London, United Kingdom

**Aim:** To investigate impact of the development and national roll-out of accredited training to support the implementation of the Enabling Self-management Coping with Arthritis Pain using Exercise (ESCAPE-pain).

**Design:** Mixed methods evaluation.

**Method:** A 1-day training course was developed for physiotherapists and fitness instructors on implementing and delivering the ESCAPE-pain programme. All participants were invited to complete an anonymous post-training survey comprising closed and open questions. Profession, location and practice setting were collected at course registration.

**Results:** Between 2017-2019, 770 people (facilitators) were trained to deliver ESCAPE-pain (488 physiotherapists, 282 fitness instructors). There has been national coverage with facilitators in all UK nations (England, Scotland, Wales and Northern Ireland) and all 9 regions of England. Satisfaction with the course was high, 99% of participants (n=662) rated the course as good (19%) or excellent (80%). Respondents valued the inter-professional aspect of the course. Facilitators (n=665) agreed (13%) or strongly agreed (87%) they understood what ESCAPE-pain was and how to implement it, 29% agreed and 71% strongly agreed they felt able to deliver ESCAPE-pain. 14 course trainers have been trained to deliver the ESCAPE-pain course and 9 new course trainers are in training. Initially, there were challenges around determining prerequisite qualifications and experience for fitness instructors. The course has been accredited by 3 national training bodies.

**Conclusion:** An inter-professional training course successfully supported the national scale-up of ESCAPE-pain.

### Key Practice Points:

- Training can be a useful approach to package knowledge about an evidence-based intervention and how to implement to support scale-up into practice.
- Inter-professional training between physiotherapists and fitness instructors can be successfully delivered; however, different knowledge-based, learning needs and practice settings need to be considered.
- Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: The impact for these peoples is unclear.

## WHICH MOBILITY ISSUES AFFECT HOW PEOPLE WITH TRAUMATIC BRAIN INJURY (TBI) PARTICIPATE IN COMMUNITY ACTIVITIES?

**Simmons N<sup>1</sup>**, Barr C<sup>1</sup>, McLoughlin J<sup>1</sup>

<sup>1</sup>College of Nursing and Health Sciences, Flinders University, Adelaide, Australia

**Aim:** The aim of this study was to investigate which factors, in relation to balance and mobility, influence activity and participation in people with Traumatic Brain Injury (TBI).

**Design:** Correlational study.

**Methods:** Twenty-five participants with TBI living in the community, 17 males and 8 females, mean age of 45±15.65 years completed a battery of outcome measures around balance and mobility in addition to the International Classification of Functioning Measure of Participation and Activities Scale (IMPACT-S).

**Results:** Several measures significantly correlated with the IMPACT-S. These included Activities-specific Balance Confidence ( $r = .746$ ,  $p < 0.001$ ), Modified Falls Efficacy Scale ( $r = .744$ ,  $p < 0.001$ ), the Fullerton Advanced Balance Scale ( $r = .664$ ,  $p < 0.001$ ), Berg Balance Scale ( $r = .639$ ,  $p = 0.001$ ) and measures of mobility including the 10-meter walk test ( $r = -.511$ ,  $p = 0.009$ ) and 6-minute walk test ( $r = .531$ ,  $p = 0.006$ ). The Global Fatigue Index ( $r = -.517$ ) ( $p = 0.008$ ) and the Dizziness Handicap Inventory ( $r = -.432$ ) ( $p = 0.031$ ) also showed significant correlation.

**Conclusion:** Several aspects of mobility correlate with activity and participation in people with TBI. Balance confidence, fear of falls and balance function correlated most strongly in this group.

**Key Practice Points:**

- Objective measures of balance and mobility correlate with participation and activity levels in people with TBI.
- Balance confidence and fear of falling show strong correlation and need further consideration in future research and clinical practice in people with TBI.

## RELIABILITY, VALIDITY AND SMALLEST REAL DIFFERENCE OF THE ANKLE LUNGE TEST FOR MEASUREMENT OF DORSIFLEXION FOLLOWING STROKE.

**Simondson J<sup>1,2,3</sup>**, Brock K<sup>1,2,3</sup>, Formby C<sup>3</sup>, Simondson D<sup>1</sup>, Murphy D<sup>2</sup>

<sup>1</sup>Physiotherapy Department, St Vincent's Health Melbourne,, <sup>2</sup>Rehabilitation Unit, St Vincent's Health Melbourne, , , <sup>3</sup>St Vincent's Health Independence Programme, ,

**Aim:** The ALT (Ankle Lunge Test) is a reliable method of measuring weight bearing ankle dorsiflexion range in orthopaedic ankle conditions. The aim of this study is to evaluate the reliability, and concurrent validity of the ALT in stroke.

**Method:** Repeated measure design.

A convenience sample of stroke survivors were recruited and the ALT was performed three times, by two physiotherapists (randomised order) with a 10 minute rest interval. Testing was repeated by one physiotherapist one to five days later with the addition of mobility measures; walking speed, FAC (Functional Ambulation Classification) and TUG (Timed Up and Go) and the Tardieu scale for spasticity.

**Results:** Data was obtained for 40 participants, 70% were male with an average age 65 years (range 24 to 92). Intrarater, interrater and test retest reliability yielded intra class correlations at or above .916. The smallest real difference was calculated as 26 mm for the same rater on two occasions.

Moderate correlations were found between the ALT and Velocity  $r = .61$  ( $p < .01$ ), the TUG  $r = -.60$  ( $p < .01$ ) and the FAC  $r = .38$  ( $p < .05$ ). A non linear relationship was observed between the ALT and Tardieu scores for soleus.

**Conclusion:** The ALT is a reliable and valid measure which can be easily applied for measuring dorsiflexion in weightbearing in the stroke population.

**Key Practice Points:**

- The ALT can be used as a reliable measure of ankle / foot range impairment, with an established smallest real difference of 26mm
- ALT values correlate with mobility performance.

## IMPROVING OUTCOMES FOR UPPER LIMB IN SEVERE STROKE: THE EFFICACY OF REHABILITATION INTERVENTIONS BASED ON THE BOBATH CONCEPT

Brock K<sup>1</sup>, Tillyard J<sup>2</sup>, Simondson J<sup>1</sup>, Black S<sup>1</sup>

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**Aim:** This study investigates whether a brief intervention based on the Bobath Concept improves reaching ability in people with severe stroke in comparison to a control intervention.

**Method:** Randomised controlled trial. Fifty-three participants with severe upper limb deficits, between four and 18 weeks post stroke, were recruited. Group 1 received six Bobath based interventions. Group 2 received time matched interventions with passive or assisted active movement, positioning and sham TENS. The main outcome measure was the PreFULT, which measures the distance the participant can move a mouse along each direction of a "Union Jack" template.

**Results:** Following the intervention, Group 1 had significantly higher scores on the PreFULT than Group 2; Group 1 baseline median 27.2cm (14.9, 73.4), post intervention median 59cm (28.7, 136.4), Group 2 baseline median 21.7cm (11.9, 39.6), post intervention median 35.8cm (17.4, 63.8),  $p = .04$ . Both groups improved significantly from baseline to post intervention,  $p < .01$ .

**Conclusion:** Interventions based on the Bobath concept may be more beneficial for recovery of arm control in people with severe upper limb deficits than standard care.

**Key Practice Points:**

- People with minimal arm recovery can improve movement control with a brief period of intervention.
- Interventions based on the Bobath concept may be more effective for recovery of arm control than standard care.

## CLINICAL REASONING BY ADVANCED MUSCULOSKELETAL PHYSIOTHERAPISTS IN NEUROSURGERY SPINE CLINICS: WHO SEES THE SURGEON AND WHY?

Simondson D<sup>1</sup>, Shaw B<sup>1</sup>, Kinsella R<sup>1,2</sup>, McNeil P<sup>1</sup>, Shifman J<sup>1</sup>, Farmer C<sup>1,3</sup>, Heywood S<sup>1,4</sup>

<sup>1</sup>St Vincent's Hospital Melbourne, Fitzroy, Australia, <sup>2</sup>Latrobe University, Bundoora, Australia, <sup>3</sup>Monash University, Clayton, Australia, <sup>4</sup>The University of the Melbourne, Parkville, Australia

**Aim:** The role of Advanced Musculoskeletal Physiotherapists working in Neurosurgery clinics is to efficiently filter patients likely to benefit from surgery to Neurosurgeons while managing the remainder independently. This study explores the rate, reasoning and outcome for patients with Neurosurgeon input requested by the physiotherapist.

**Design:** Retrospective audit.

**Method:** Data from medical records of patients assessed, managed and discharged by five physiotherapists in a Neurosurgery clinic were audited over 12 months. Key radiological and clinical findings that led the AMP to involve the Neurosurgeon for discussion, patient assessment or transfer of care were identified.

**Results:** 76 of 445(17%) patients seen by physiotherapists were reasoned to require input from a Neurosurgeon. Forty nine of these 76 patients had been discharged and were included in the audit. Clinical indicators of nerve compression in combination with corresponding anatomical radiological findings were the most frequent reason for input from Neurosurgeons in 25(51%) cases, with 15(31%) of these consented

for spinal surgery. Of the remaining 24(49%), progression to Neurosurgeons occurred due to: concerns related to red flags(n=6), meeting patient or GP expectations(n=6), myelopathy(n=4), imaging opinion(n=3), spondylolisthesis(n=2), previous surgery(n=1), epidural request(n=1) and carpal tunnel syndrome(n=1).

Conclusion: Advanced Musculoskeletal Physiotherapists manage the majority of their caseload independently. Input from Neurosurgeons is obtained for some presentations for a variety of reasons. Surgery is an outcome for approximately one third of patients for whom physiotherapists obtain input from neurosurgeons.

Key Practice Points:

- Matching clinical and radiological nerve compression findings are key features linked to the need for surgery.

## FACTORS IDENTIFIED BY PEOPLE WITH STROKE AS CONTRIBUTING TO SEDENTARY BEHAVIOUR DURING HOSPITAL REHABILITATION

**Simpson D<sup>1</sup>**, Breslin M<sup>1</sup>, English C<sup>2,3</sup>, Gall S<sup>1</sup>, Jose K<sup>1</sup>, Callisaya M<sup>1,4</sup>

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Aim: To understand the factors that contribute to sedentary behaviour during inpatient rehabilitation and identify opportunities for reducing sedentary behaviour after stroke

Design: Qualitative study

Methods: Interviews with 15 people with stroke discharged from rehabilitation in the previous 4-weeks. Semi-structured interviews were conducted, audio recorded and transcribed before being analysed thematically.

Results: Participants were 37–93 years (8 male, 6 community ambulant). Three key themes were identified as contributing to sedentary behaviour including: Understanding – limited understanding of the impact of sedentary behaviour and the role of activity in recovery after stroke impacted engagement in activity; Safety messages – staff were perceived to prioritise safety over activity participation; Physical Environment – characteristics of the rehabilitation ward restricted/discouraged independent activity. Aspects identified as supporting activity in hospital included structured activity opportunities (formal and informal), positive feedback (staff and family), and desire to resume life roles and valued activities.

Conclusion: To reduce sedentary behaviour in rehabilitation, an understanding of the role of physical activity in recovery, including recommendations about activity outside structured therapy sessions is important. Conflicting information about safety impacts negatively on a person's self-efficacy to engage in activity. Ensuring the ward environment supports engagement in physical activity is also important.

Key Practice Points:

- Education, feedback about activity and consistent safety advice can be provided by physiotherapists to reduce sedentary behaviour.
- Physiotherapists can help people build an understanding of the role of physical activity in stroke recovery.
- Specific recommendations (what activity, when, where and how much) assist understanding and engagement in structured activity opportunities.

## INSIGHTS INTO INDIGENOUS CULTURAL CAPABILITY JOURNEYS FOR PHYSIOTHERAPY STUDENTS: NAVIGATION, SOCIALISATION AND REFRAMING THE MEANING OF SUCCESS

**Skinner K<sup>1</sup>**, O'Connor S<sup>2</sup>, McPherson K<sup>1</sup>, Andrews K<sup>2</sup>, Lewis M<sup>3</sup>, Robinson C<sup>2</sup>

<sup>1</sup>Charles Sturt University, Orange, Australia, <sup>2</sup>Charles Sturt University, Albury, Australia, <sup>3</sup>Charles Sturt University, Bathurst, Australia

**Aim:** to explore physiotherapy student perspectives on learning experiences which influenced the development of their cultural capability.

**Design:** Cross sectional online survey

**Method:** A process of literature review, analysis of existing surveys to build a question bank, and consultation with Indigenous colleagues and physiotherapy students informed the development of a pilot online survey to gain initial insights into students' perception of their cultural capability. Qualitative data was interpreted using the constant comparative method, to reach consensus on emergent themes. Research was approved by Charles Sturt University Human Research Ethics Committee.

**Results:** Themes were clustered around 'navigating the learning journey for and with students'. Key insights included: scaffolding to support the process of change; socialisation into a health professional identity; and reframing the historical meaning of 'academic success' in an Indigenous Cultural Capability curriculum to consider contemporary measures consistent with a competence continuum as described in the "Physiotherapy practice thresholds in Australia and Aotearoa New Zealand".

**Conclusion:** It is important to highlight the role of teaching staff in navigating the students' cultural capability journey and to realize that students arrive with unique lived experiences that inform this journey. There may be great variability in what the threshold competence "prioritise cultural safety and cultural respect" looks like for each individual graduate.

**Key Practice Points:**

- Cultural capability curriculum is complex because both student and teacher are embedded in their own cultural context.
- Understanding student journeys enables insights into how a strengths-based, holistic and scaffolded curriculum can be designed to support cultural capability development.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait islander people:** Physiotherapy graduates who demonstrate cultural humility have the potential to improve health outcomes for Aboriginal and Torres Strait Islander people through the delivery of quality, culturally competent, accessible physiotherapy services.

## DRIVING MUSCULOSKELETAL PAIN TRANSFORMATION ACROSS THE HEALTHCARE ECOSYSTEM: CONNECTING PATIENTS, PRACTITIONERS, PROVIDERS AND POLICY MAKERS

**Slater H<sup>1</sup>**

<sup>1</sup>*School of Physiotherapy and Exercise Science, Curtin University, Perth, Australia*

Transformation of health systems is critical if we are to address the escalating burden-service gap imposed by musculoskeletal pain conditions, ensure quality and sustainability of 'right care' and meet the 2030 Sustainable Development Goals.

Over the past decade and a half, our team has led a program of translational research to support system-wide reform in musculoskeletal pain care. The overarching aim of this research is connecting consumers and clinicians with services and policy to strengthen health systems and promote efficient, effective and sustainable person-centred musculoskeletal pain care.

Using Models of Care as a policy vehicle, we show how evidence can be driven through policy into services and practice to support this necessary reform. Outcomes from our translation initiatives will be presented using real world examples of musculoskeletal pain care including from the macro level (policy and systems) through the meso level (service delivery, health workforce) to the micro (clinical interface: clinicians and consumers) level. A specific focus will be the use of digital technologies as an implementation enabler, allowing people and services to better connect, with capacity to scale, to deliver system and economic efficiencies, to contribute to sustainability and to mitigate access and care disparities.

Key Practice Points:

- Connecting consumers, clinicians, health service providers and policy makers is key to building whole-of-system capacity and supporting transformation of musculoskeletal pain.
- Implementation of musculoskeletal Models of Care leveraging off digital technologies, is one approach to promote high value safe musculoskeletal pain care and reduce the use of low value care.

## APPLIED POSITIVE PSYCHOLOGY FOR PHYSIOTHERAPISTS

**Smith R<sup>1,2</sup>**

<sup>1</sup>*Smith & Wellness, Kent Town, Australia,* <sup>2</sup>*SAHMRI (South Australian Health and Medical Research Institute), Adelaide, Australia*

Background: Behaviour change is an assumed "prerequisite" that physiotherapists often expect of their clients. Unfortunately, there is also often an unspoken battle between therapist and client whereby the practitioner hopes that their client will adopt new habits as per clinical advice, and the client hopes that their therapist will be an agent of change (sometimes instead of taking responsibility for change themselves). The field of psychology offers wisdom that physiotherapists can leverage from to great effect to resolve this tension, as long as clear boundaries are understood in regards to the therapist's scope of practice.

Aims/objectives: To introduce concepts from the field of positive psychology, demonstrating how they can be used to elicit behaviour change without crossing the line into psychological support for mental health care.

Approach: Background information will be presented via PowerPoint (5 minutes) followed by a facilitated discussion between participants on relevance to their work context (5 minutes). Subsequently three positive psychology interventions will be introduced and practiced through facilitated conversational activities between participants (20 minutes).

Key Practice Points:

- Participants will understand the difference between traditional psychological approaches and contemporary positive psychology interventions
- Participants will practice techniques in cultivating positive emotions, using active constructive responding and articulating strengths, and will understand the basic theoretical and research underpinnings to these
- Participants will understand the use and limitations of positive psychology techniques in regards to their scope of practice

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Where these interventions are applied by or with Indigenous therapists or clients, they stand to improve communication and self-efficacy by supporting the collectivist and relational nature of Aboriginal and Torres Strait Islander cultures.

## MENTAL FITNESS: A NECESSARY FOUNDATION FOR PHYSICAL HEALTH

Smith R<sup>1,2</sup>

<sup>1</sup>Smith & Wellness, Kent Town, Australia, <sup>2</sup>SAHMRI (South Australian Health and Medical Research Institute), Adelaide, Australia

Background: Both research and observation point to a link between one's levels of self-belief, adaptability and optimism, and one's physical health outcomes. Unfortunately, when a client presents who is lacking these psychological resources, there is often a lack of confidence in the therapist with how to safely and effectively address these issues in order to improve physical health outcomes for that client.

Aims/objectives: To introduce a three-part framework of mental fitness which is analogous to physical fitness, and is intended as a scaffold for physiotherapists to tackle behavioural and cognitive skill-building without encroaching on the bounds of the mental health professions.

Approach: An explanation and visual model of mental fitness will be presented (10 minutes) followed by strategies for building mental strength (5 minutes), mental flexibility (5 minutes) and mental endurance (5 minutes). The session will close with a facilitated discussion between participants on applications for these strategies in their working context (5 minutes).

Key Practice Points:

- Participants will learn new terminology in regards to mental strength, mental flexibility and mental endurance, and be able to explain this framework using metaphors related to physical fitness
- Participants will be able to explain how mental fitness relates to and supports physical health outcomes
- Participants will understand the use and limitations of mental fitness strategies in regards to their scope of practice

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The strategies and concepts covered in this session may be applied by or with Indigenous therapists or clients as a means of improving self-awareness and proactive health behaviours.



## PREVENTING PROFESSIONAL BURNOUT

Smith R<sup>1,2</sup>

<sup>1</sup>Smith & Wellness, Kent Town, Australia, <sup>2</sup>SAHMRI (South Australian Health and Medical Research Institute), Adelaide, Australia

**Background:** Poor staff retention is a commonly cited problem for physiotherapy employers, with staff turnover and professional burnout being inter-related issues. Physiotherapists as a group tend to show an orientation towards high achievement and helping others, value systems which when combined and taken to extremes, can lead to burnout and the detriment of employer, therapist and clients alike.

**Aims/objectives:** To introduce a model of self-care based on identity and values, relationship to self and relationship to others. This model of self-care will be explained in relation to career and workforce longevity for physiotherapists, as well as a framework that can be applied to client groups for their own self-care.

**Approach:** Statistics from allied health and medical workforces in relation to professional burnout and turnover will be presented, to make a case for the importance of therapist self-care. Thereafter, discussions in pairs and small groups will be facilitated to introduce and explore the topics of identity formation, boundary setting and internal versus external communication.

**Key Practice Points:**

It is intended that participants will leave the session with:

- An renewed appreciation for the importance of self-care, and its particular relevance in a health care setting
- An understanding of next steps they can take with their own self-care
- Insights into the applied and theoretical basis for encouraging and facilitating client self-care

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The strategies and concepts covered in this session may be applied by or with Indigenous therapists or clients as a means of improving intra-personal understanding, inter-personal communication and/or health behaviours and outcomes.

## ULTRASOUND IMAGING DETERMINED MUSCLE ATROPHY IS PRESENT IN PLANTAR HEEL PAIN THAT PERSISTS BEYOND 2 YEARS: A CROSS-SECTIONAL STUDY

Frnettovich Smith M<sup>1</sup>, Collins N<sup>1</sup>, Vicenzino B<sup>1</sup>

<sup>1</sup>The University Of Queensland, St Lucia, Australia

**Aim:** The aim of this study was to evaluate intrinsic foot muscle morphology in individuals with and without plantar heel pain.

**Design:** Cross-sectional study.

**Method:** 30 individuals with plantar heel pain and 30 healthy individuals underwent ultrasound imaging of the abductor hallucis and muscles of the first interstitial space (adductor hallucis, first dorsal interossei, first lumbrical) in non-weight bearing and weight bearing positions. Measurements of muscle thickness and cross-sectional area were obtained from images. To investigate differences in measurements of intrinsic foot muscle morphology, a repeated measures multivariate analysis of covariance was conducted.

**Results:** Abductor hallucis cross-sectional area was smaller in individuals with persistent (symptom duration longer than 2 years) plantar heel pain (mean difference -0.76cm<sup>2</sup>, 95% confidence interval -1.35 to -0.18, p =

0.006), but not in those with shorter duration of symptoms (-0.16cm<sup>2</sup>, -0.60 to 0.29,  $p = 1.0$ ), when compared to healthy individuals. The observed difference exceeded the minimal detectable difference (0.30cm<sup>2</sup>). There were no between-group differences observed in thickness of the abductor hallucis or the muscles of the first interstitial space ( $p > 0.05$ ).

Conclusion: Atrophy of the abductor hallucis muscle was evident only in individuals with persistent plantar heel pain, which suggests that it may be a consequence rather than contributing factor in the development of the condition.

Key Practice Points:

- Interventions that address abductor hallucis atrophy, such as exercise and footwear, may be beneficial to include in the management of plantar heel pain.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: This research will be relevant for Aboriginal and Torres Strait Islander people who experience plantar heel pain.

## DEVELOPMENT OF PEDIATRIC OUTCOME MEASURES (AND ITS PITFALLS)

Smits-Engelsman B<sup>1</sup>

<sup>1</sup>University of Cape Town, Cape Town, South Africa

One of the responsibilities of any professional is to keep up with new knowledge and current developments. However, staying current in physiotherapy is challenging, especially for busy clinicians who have limited time to search the literature. For the choice of interventions, clinicians can sometimes rely on clinical practice guidelines developed by expert groups. However, selecting instruments for evaluation in paediatric physiotherapy settings, it is much harder to find guidelines or reviews containing a detailed summary of relevant measures and their psychometric properties. Although, we know that children are not mini-adults, psychometric data from adult studies are still used to validate outcome measures in children. In cases where instruments have even been scrutinized in the population of children we want to apply the tools to, some questions still remain unanswered: What do the reported psychometric properties mean for a specific patient/client? What are the limitations of the outcomes obtained using the tool in question given its lack of appropriate psychometric data?

This talk will shed more light on the different aspects of tool use in paediatric physiotherapy practice. The steps in developing a new tool will be used as a common thread throughout this talk to explain the meaning of the psychometric terms. Special attention will be given to task analysis of test items in relation to possible internal constraints of the child.

Key Practice Points:

- Provide clinicians with knowledge to determine quality of outcome measures being used and how to interpret results in the presence of limitations of the tool.

## AUSTRALIAN PHYSIOTHERAPISTS DELIVER CARE CONSISTENT WITH GUIDELINE RECOMMENDATIONS FOR ROTATOR CUFF TENDINOPATHY, ALTHOUGH VARIABILITY EXISTS IN EXERCISE PARAMETERS AND ADVICE

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<sup>1</sup>A Game Physiotherapy, Somerville, Australia, <sup>2</sup>Monash University, Frankston, Australia, <sup>3</sup>Keele University, Staffordshire, United Kingdom, <sup>4</sup>Doncaster Royal Infirmary, Doncaster, United Kingdom

Aim: To review the extent to which Australian physiotherapists adhere to recommended management of rotator cuff tendinopathy in clinical practice.

Design: A cross-sectional online survey

Method: The study surveyed five hundred and two Australian physiotherapists recruited through the Australian Physiotherapy Association's newsletter. Qualitative content analysis and statistical analysis were used to analyse survey results.

Results: Results demonstrated that the majority of Australian physiotherapists provide conservative management consistent with guideline recommendations, through delivery of exercise and education avoiding inappropriate referrals for imaging and surgical opinion. Parameters and construction of exercise treatment programs were highly variable within the cohort and non-recommended care is still being delivered through adjunctive modalities (eg. Therapeutic ultrasound). Significant uncertainty exists as to when referral for injection is indicated, more prevalent in those not working in private practice. Many physiotherapists participate in out of scope care recommending the use of NSAIDs to patients and rural physiotherapists review patients significantly less frequently, not meeting guideline recommendations.

Conclusions: Australian physiotherapists are broadly consistent with providing recommended management, however heterogeneity exists in the methods and parameters of treatment delivery.

Key Practice Points:

- Further education is required regarding the role and timing of referral for injection
- Physiotherapists need to be aware that providing advice regarding NSAIDs is currently not in the physiotherapists scope of practice
- Physiotherapists should limit low value adjunctive management

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population

## PEOPLE WITH ROTATOR CUFF TENDINOPATHY REPORT HAVING MANAGEMENT THAT IS NOT CONSISTENT WITH CURRENT GUIDELINES

Smythe A<sup>1</sup>, White J<sup>2</sup>, Littlewood C<sup>3</sup>, Bury J<sup>4</sup>, Haines T<sup>2</sup>, Malliaras P<sup>2</sup>

<sup>1</sup>A Game Physiotherapy, Somerville, Australia, <sup>2</sup>Monash University, Frankston, Australia, <sup>3</sup>Keele University, Staffordshire, United Kingdom, <sup>4</sup>Doncaster Royal Infirmary, Doncaster, United Kingdom

Aim: To evaluate whether people with rotator cuff tendinopathy receive recommended management

Design: A cross-sectional observational study

Method: The study surveyed sixty three patients with rotator cuff tendinopathy, recruited from a large radiology clinic in Melbourne. Qualitative content analysis and statistical analysis were used to analyse survey results.

Results: Sixty three survey participants met the inclusion criteria and were included in analysis. Results demonstrated that people received care that was not always consistent with recommended practice. Almost half had imaging (49%) or surgery (50%), and a third (33%) had an injection, prior to guideline recommended conservative care. The type of education delivered and exercise parameters prescribed were highly variable. Sixty-eight percent of people surveyed expressed that they would only feel confident with a diagnosis if they had imaging and 30% would be willing to undergo surgery if imaging found abnormality and there were no symptoms.

Conclusions: Patients with rotator cuff tendinopathy in Australia experience care that is highly variable and not always consistent with recommended practice. Patient beliefs may be a driver of this finding and should be explored in future research.

Key Practice Points:

- Patient beliefs may affect adherence to recommended conservative management pathways
- Clinician related barriers (e.g. knowledge) to recommended care for rotator cuff tendinopathy need to be explored

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population

## WHAT IS 'EFFECTIVE CLINICAL SUPERVISION' OF PHYSIOTHERAPISTS? A QUALITATIVE STUDY

**Snowdon D<sup>1,2,3</sup>**, Cooke S<sup>3</sup>, Lawler K<sup>3,4</sup>, Scroggie G<sup>3</sup>, Williams K<sup>3</sup>, Taylor N<sup>3,5</sup>

<sup>1</sup>Peninsula Health, Frankston, Australia, <sup>2</sup>Monash University, Frankston, Australia, <sup>3</sup>Eastern Health, Box Hill, Australia,

<sup>4</sup>University of Tasmania, Hobart, Australia, <sup>5</sup>La Trobe University, Bundoora, Australia

Aim: The purpose of this project was to establish how to facilitate effective clinical supervision for physiotherapists working clinically in a public health service.

Design: A qualitative study design.

Method: Semi-structured interviews were conducted to explore physiotherapists' (n=21) experience with clinical supervision. Interviews were audio-recorded and transcribed. Transcripts were coded independently by two researchers. Analysis was undertaken using an interpretive description approach.

Results: The major theme was that the content of clinical supervision should focus on clinical and non-clinical professional skill development. Four sub-themes emerged as having an influence on the effectiveness of supervision: the model of clinical supervision, the clinical supervision processes, supervisor factors and supervisee factors. All sub-themes interact with each other and have the potential to act as either a barrier or facilitator to effective clinical supervision.

Conclusion: Physiotherapists in this study preferred a direct model of supervision where their supervisor directly observes and guides their professional skill development. They also specified the importance of informal supervision where guidance is provided as issues arise from supervisors who value supervision. They emphasised that supervision should be driven by their learning needs rather than health organisation processes. These factors should be considered when developing supervision policies and procedures, which commonly encourage 'formal sit down' supervision involving reflective practice.

Key Practice Points:

- Physiotherapists prefer clinical supervision that includes direct observation and guidance from their supervisor in the clinical setting
- Reflective models of supervision that occur away from the clinical environment may have limitations in supporting physiotherapists.

## DIRECT SUPERVISION OF PHYSIOTHERAPISTS IMPROVES COMPLIANCE WITH CLINICAL PRACTICE GUIDELINES AND OUTCOMES FOR PATIENTS WITH HIP FRACTURE

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<sup>1</sup>Peninsula Health, Frankston, Australia, <sup>2</sup>La Trobe University, Bundoora, Australia, <sup>3</sup>Eastern Health, Box Hill, Australia

**Aim:** To determine if the addition of direct supervision to usual reflective clinical supervision practice of physiotherapists can improve compliance with clinical practice guidelines and post-surgical outcomes for patients with hip fracture.

**Design:** A controlled before-and-after study was conducted on two acute orthopaedic wards.

**Method:** Junior and mid-level physiotherapists on one ward were provided with direct supervision during their post-operative management of patients with hip fracture. Physiotherapists on the comparison ward received reflective supervision. The primary outcome was patient compliance with the hip fracture guideline to mobilise on the day following surgery. Secondary patient outcomes included physical function on the fifth post-operative day. All data were collected from patient medical records. Compliance with guidelines was analysed using logistic regression and reported as odds ratio (95%CI).

**Results:** Data were collected from 290 patients with hip fracture. Patients at the direct supervision site were more likely to mobilise on the day after surgery (OR 3.14, 95% CI 1.41 to 7.01;  $p=0.005$ ) and by the second post-operative day (OR 4.62, 95% CI 2.31 to 9.23;  $p<0.001$ ) compared to patients at the comparison site. Patients walked further on the fifth post-operative day ( $p<0.001$ ) with less assistance from therapists ( $p=0.04$ ).

**Conclusion:** The addition of direct supervision improved physiotherapists' compliance with hip fracture guidelines and walking endurance and independence in hospitalised patients with hip fracture.

**Key Practice Points:**

- The addition of direct supervision, where physiotherapists are directly observed in their clinical practice, to reflective supervision can improve care and outcomes for patients with hip fracture.

## OSTEOARTHRITIS, RISK OF FALLS AND FALLS PREVENTION - IS IT TIME TO CHANGE OUR TERMINOLOGY?

Soh S<sup>1</sup>, Ayton D<sup>1</sup>, Tsindos T<sup>1</sup>, Ackerman I<sup>1</sup>

<sup>1</sup>Monash University, Frankston, Australia

**Aim:** To explore the perceptions and experiences of falls and engagement in falls prevention programs among older people with hip or knee osteoarthritis (OA).

**Design:** Qualitative study.

**Method:** Semi-structured telephone interviews were conducted with people aged over 50 years with doctor diagnosed hip or knee OA. Two researchers independently analysed the data via thematic analysis.

**Results:** Participants were 18 women and two men aged between 52 and 84 years. Stigma around the term 'falls' and 'falls prevention' was a clear theme that emerged from the interviews. Participants considered 'falls prevention' was only for people who were 'old and frail', and felt they were not at risk of falls because they are not 'old'. Other barriers to participation in falls prevention programs included a lack of transport

options, high cost and a lack of awareness about how to access such programs. The main enabler to engaging in falls prevention was to focus on the broader health and well-being benefits of exercise when communicating with people with OA.

Conclusion: Our findings indicate that the term ‘falls prevention’ does not appeal to people with OA and the use of positive health messages are needed to facilitate the uptake of falls prevention programs by these individuals.

Key Practice Points:

- Older people with OA perceive that falls prevention is relevant only for ‘old’ people’.
- Revising our terminology to reflect positive messaging could improve the uptake of falls prevention programs.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: While the specific rates of falls and osteoarthritis among Aboriginal and Torres Strait Islander people is unknown, efforts to increase awareness and prevent falls must encompass all Australians and consider culturally sensitive approaches

## AQUATIC REHABILITATION OF MUSCULOSKELETAL INJURIES: FROM LOW LOAD TO HIGH PERFORMANCE

Spurrier D<sup>1</sup>

<sup>1</sup> Mitcham Rehab & Marion Sports Physio, Kingswood, Australia

Water offers an option for exercise and rehabilitation that is less loaded for early stage musculoskeletal injury but can also be used in high performance situations. Force with both buoyancy and drag can be progressed in line with the physiological stages of healing and the requirements of loading. There are both opportunities and limitations in aquatic exercise at all stages of rehabilitation and for all types of musculoskeletal presentations, from early mobility through to high performance.

## “MY KNEE IS STUFFED – IT’S BONE-ON-BONE”: TIME TO RECONCEPTUALISE OSTEOARTHRITIC PAIN?

Stanton T<sup>1,2</sup>

<sup>1</sup>The University of South Australia, Adelaide, Australia, <sup>2</sup>Neuroscience Research Australia, Sydney, Australia

Osteoarthritic pain has largely been assumed to be driven solely by structural damage to the joint. However, that pain levels have a tenuous relationship with the degree of structural damage and that people with severe osteoarthritic changes on imaging have improvements in pain with exercise (in the absence of joint changes) suggests that we need to re-think such an assumption. This presentation will provide new evidence from pain neuroscience which supports that we need to reconceptualise osteoarthritic pain. That is, no longer consider osteoarthritic pain as a marker of joint damage, but rather, as a function of the protective state of the neural system. This talk will explore evidence that the pain system’s protective state is upregulated in osteoarthritis, but also discuss that certain inherent features of the neural system that can modulate pain appear intact in people with osteoarthritis. Last, this talk will discuss the impact that the words we use as clinicians can have on pain (and the relevance to osteoarthritis) by exploring examples of in which knowledge increases or decreases the need to protect, and thus, increases or decreases pain. Together, this will be placed into context of our current treatment of osteoarthritic pain.

Key Practice Points:

- Imaging findings in osteoarthritis do not dictate a person’s potential pain or function.
- People with osteoarthritic pain have an over-protective pain system.

- Using strategies to promote down-regulation of this over-protective system can be helpful: here, our words, our explanations, and active treatment can play a key role.

## HARNESSING DIGITAL HEALTH TECHNOLOGIES TO PROMOTE PAIN SELF-MANAGEMENT IN YOUNG PEOPLE

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<sup>1</sup>The Hospital for Sick Children, Toronto, Canada, <sup>2</sup>Lawrence S. Bloomberg Faculty of Nursing, , Toronto, Canada

Chronic pain in adolescents is common and can negatively impact all aspects of health-related quality of life (HRQL). Most young people do not received education and skills on how to manage their pain condition. Dr. Stinson will describe a user-centred design approach to development and evaluation of digital health technologies. She will discuss three applications: (1) Teens Taking Charge: Managing Juvenile Arthritis Online. This web-based program was evaluated in a multi-centre randomized controlled trial (RCT; N=333). Adolescents who were randomized to the intervention group demonstrated significant reductions in pain intensity and interference and improvements in aspects of HRQL compared with education control. These health improvements were maintained up to 12 months after program completion. (2) iPeer2Peer, a Skype-based peer mentoring program that has been evaluated in pilot RCTs in adolescents with arthritis and chronic pain, respectively. Both trials identified significant improvements in self-management and adaptive coping. (3) Pain Squad and Pain Squad+, smartphone applications to track pain and provide “just-in-time” pain management advice to youth with cancer, respectively. A prospective study of Pain Squad (N=99) found evidence of test-retest reliability, construct validity and responsiveness. A pre-post study of Pain Squad+ (N=40) in youth with cancer demonstrated significant reductions in pain intensity and interference as well as improvements in aspects of HRQL after 28 days of app use. Finally, Dr. Stinson will summarize key opportunities and challenges using digital health technologies to promote pain self-management in clinical practice.

### Key Practice Points

At the end of this session: participants will:

- have an understanding of the importance of using a user-centred design framework
- have access to digital resources to promote pain self-management in young people in their practice.

## DESIGNING PRODUCTIVE WORK TASKS TO BE PHYSICALLY HEALTH PROMOTING: THE GOLDDILOCKS PRINCIPLE

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Background: Many occupational tasks have traditionally created physical stresses that were too great for workers, resulting in fatigue, cumulative trauma and acute injury. Over the past 70 years ergonomics and occupational health initiatives have supported the redesign and increased mechanisation of physically stressful tasks to reduce the physical load on workers. By reducing the intensity, frequency and duration of physical loads it was hoped that worker health would be improved. However over the past decade there has been the increasing recognition that occupational tasks that have too little physical stress can also create health risks for workers. Redesign of work tasks to reduce sedentary behaviour and increase physical stresses through changes in posture and movement are now becoming prevalent. It is now clear that occupational physical stress should be designed to be ‘just right’, to stimulate physiological responses important for health, whilst enabling sufficient recovery.

Objectives: This presentation will outline the Goldilocks Principle and propose its use as a new paradigm to not only reduce health impairments related to work but to also promote improvements in physical capacity and health.



#### Key Practice Points:

- Better design of work tasks to be ‘just right’ to promote health offers a new approach for physiotherapists to enhance client’s health and capacity. This is particularly important given the potential for this approach to reach large groups in the population, including groups more vulnerable and in greater need such as aging workers and those with less socio-economic advantage.

## PREDICTING THE ABILITY TO WALK INDEPENDENTLY AFTER A STROKE: EXTERNAL VALIDATION OF PROGNOSTIC MODELS

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**Aim:** To externally validate prognostic models that predict independent walking after stroke.

**Design:** Validation study using baseline data from the Danish Stroke Registry and discharge data following rehabilitation from Hammel Neurocentre (n=768 adult stroke patients).

**Method:** A systematic literature search identified high quality prognostic models predicting independent walking (with or without aid). Both models used predictors easily obtained in clinical practice, but were not internally validated. Included models were assessed with the PROBAST tool. To be able to validate the models, predictor variables were matched to proxies in the validation dataset. We calculated the area under the receiver-operating characteristic curve (AUC) and calibration curves. If AUC was <0.7, adjustments were made to re-estimate the intercepts and regression coefficients.

**Results:** Two studies met the selection criteria, both scoring ‘High’ risk of bias. We were unable to validate one model as no proxies were identified. The remaining model used the NIHSS score and age to predict walking independence. In the validation dataset, the Scandinavian Stroke Scale was used as a proxy for NIHSS. The model showed an AUC=0.68 (95% CI: 0.65 to 0.71) and overestimation in the calibration curve. Re-estimation of the intercept and/or regression coefficients showed little improvement (AUC range from 0.61 to 0.69).

**Conclusion:** The included prognostic model showed poor predictive performance in the validation dataset.

#### Key Practice Points:

- External validation of a prognostic model is necessary to ensure model generalisability and clinical usefulness.
- Currently, no prognostic models to predict independent walking are available for clinical practice

## THE INTERACTION OF SADDLE, HORSE AND RIDER

Sullivan-Butt K

Saddle fit is one of the key determinants in the effective communication between horse and rider. Saddles in suboptimal position may be the cause of injury or a reflection of a pre-existing condition. Poor saddle balance as a result of incorrect fit will result in performance limitations and injury in both these athletes. Poor saddle balance may also indicate postural, conformational and pathology issues of horse and rider. Practitioners should be able to recognise some of the key determinants of suboptimal saddle fit and saddle balance in order that these may be addressed.

Visual illustration of optimal and suboptimal saddle balance will be highlighted utilising photos of rider balance, horse sweat patterns and rider plus equine stance. The effect of changes in saddle balance will be indicated using saddle horse with ability to change balance; saddle pressure pad analysis plus selection of peer reviewed studies and resulting data.

### Objective

Practitioners will understand the importance of saddle fit and balance, recognising key indicators of poor saddle positioning in order that these may be addressed.

### Key Practice Points:

- Physiotherapists working with elite athletes will have a client base that largely utilises the use of a saddle as their primary piece of equipment.
- A holistic approach to treating the ridden horse incorporates examining the saddle. Understanding how the saddle sits allows the practitioner to have a better comprehension of where to search for injury.
- Alternatively it is important to recognise that the way the saddle sits may be the primary cause of injury or a contributing factor.
- Recognising key indicators of saddle balance, rider position, saddle wear and lateral movement will assist in determining optimum treatment and if additional support from a saddle professional (fitter) required.

## WHICH TEST IS BEST? MUSCLE STRENGTH TESTING IN NEUROLOGICAL REHABILITATION.

Sutherland E<sup>1</sup>, Kahn M<sup>1,3</sup>, Williams G<sup>1,2</sup>

<sup>1</sup>Epworth Healthcare , Richmond, Australia, <sup>2</sup>The University Of Melbourne, Carlton, Australia, <sup>3</sup>The University of the Sunshine Coast , Sippy Downs , Australia

**Aims:** To compare and evaluate five commonly used clinical tests of leg muscle strength for reliability, clinical utility and discriminative ability within neurological rehabilitation.

**Method:** Participants (n=36) with leg weakness as a result of an upper motor neuron syndrome (UMNS) were stratified according to the Functional Ambulation Classification (FAC). On two discrete testing sessions, each participant was tested on:

1. Functional sit to stand
2. 1 repetition maximum (1RM) leg press
3. Manual muscle test
4. Load cell leg press
5. Hand held dynamometer (HHD)

Results: Functional sit to stand testing demonstrated a considerable floor effect, with only 25% of participants in FAC categories  $\leq 3$  recording a score. Similarly, only 50% of FAC categories 0 – 2 could perform 1RM testing. Despite high test-retest reliability within participants, manual muscle testing scores across the FAC categories was highly variable. Load cell leg press and HHD were most discriminative, they are isometric and involve additional costs.

Conclusion: There is no single optimal test of leg strength that is reliable, discriminative and has good clinical utility across a range of FAC categories.

Key Practice Points:

- Functional sit to stand and 1RM are too difficult for most people in FAC categories  $\leq 2$
- Manual muscle testing is not an objective measure of strength for the majority people in FAC categories  $\geq 3$
- Load cells and hand held dynamometers require additional costs and equipment, which impact on the clinical utility of the test

## MANAGING HEALTHCARE COMPLEXITY: THE CONTRIBUTION AND INFRASTRUCTURE FOR ADVANCED PRACTICE PHYSIOTHERAPY IN THE UNITED KINGDOM

Syme G<sup>1</sup>

<sup>1</sup>Victoria Hospital, Kirkcaldy, Scotland

Healthcare services across the globe face unprecedented times with aging populations, increasing multimorbidities, changes in workforce supply, the availability of new technologies and increasing service user demand. Advanced Practice Physiotherapists in the UK have been evolving since the late eighties and have made a significant contribution to addressing some of these challenges across a wealth of specialties e.g. musculoskeletal, respiratory, pelvic health, neurology, pain management, emergency care and rheumatology services.

The objectives of this presentation are:

- 1) To outline the impact that Advanced Practice Physiotherapists are making to a rapidly changing and increasingly complex health care environment.
- 2) To present a critically appraisal of the contemporary opportunities and challenges facing Advanced Practice Physiotherapy
- 3) To specify the requirements for the continued evolution of Advanced Practice Physiotherapy roles.

Key Practice Points

- Advanced Practice Physiotherapy has the potential to make a considerable contribution to contemporary healthcare and is a key driver to exploring new horizons for physiotherapy practice. Advanced Practice Physiotherapy requires a robust infrastructure to maximise its potential and provide a safe and sustainable model for physiotherapists.
- Expanding the boundaries of clinical practice, whilst an essential component of physiotherapy development, can be challenging. This necessitates the integration of clinical excellence, leadership, education, research and audit at professional, organisational and individual levels.

Drawing upon personal experience, integrated with literature and data in the field, these key issues are distilled to a practical framework.

## HEADS-DOWN TRIBE – EFFECTS OF SMARTPHONE USE ON NECK PAIN IN DIFFERENT AGE GROUPS

Szeto G<sup>1</sup>

<sup>1</sup>*School of Medical & Health Sciences, Tung Wah College, , Hong Kong*

In recent years, smartphones have become an essential everyday instrument of communication and entertainment around the world. It is common for people to spend 2-4 hours per day using their smartphones. Adopting the “head-down” posture for prolonged periods may lead to increased risk of neck-shoulder pain. Office workers and university students are more susceptible to such pain as they may frequently multitask with their desktop/laptop computers and smartphones during daytime.

The fascination with mobile devices is also associated with increasing sedentary lifestyle in young children. The latest guidelines released by WHO warns about the adverse health effects of excessive screen time and insufficient physical activity for children under the age of 5.

Physiotherapists deal with patients of all age groups who suffer from musculoskeletal symptoms related to use of all forms of electronic devices – smartphones, tablet computers and desktops. We need to provide appropriate advice to our clients on how to reduce the risk and improve their health.

Key Practice Points:

In this presentation, Grace will provide:

- An overview on the latest research about the prevalence of musculoskeletal disorders and associated risk factors – posture, duration of use and tasks performed on mobile devices.
- Research on physical risk factors such as posture and muscle control in using mobile devices.
- Provide practical information to physiotherapists to give advice to patients regarding the health risks of excessive use of electronic devices.

## A PROSPECTIVE QUASI-EXPERIMENTAL CONTROLLED STUDY EVALUATING THE USE OF DEFO TO MANAGE COMMON POSTPARTUM AILMENTS DURING POSTNATAL CARE.

Szkwara J<sup>1</sup>, Milne N<sup>1</sup>, Rathbone E<sup>1</sup>

<sup>1</sup>*Bond University, Gold Coast, Australia*

Aim: To determine if a postnatal dynamic elastomeric fabric orthoses (DEFO) is effective for managing pain from common postnatal ailments.

Design: Prospective quasi-experimental controlled study.

Method: 51 women (compression shorts group (SG): n= 43, comparison group (CG): n= 8) were recruited from hospital and community-based health clinics. All women were evaluated day 0 to 10 days post-delivery (baseline). The SG wore a DEFO (SRC Recovery Shorts) and received standard postnatal care. CG received standard postnatal care alone. The primary outcome (Numeric Pain Rating Scale (NPRS)) was assessed fortnightly for 8 weeks. Secondary outcome measures included – Roland Morris Disability Questionnaire (RMDQ), Pelvic Floor Impact Questionnaire-7 (PFIQ-7) and SF-36 Short Form Health Survey (SF-36)

Results: The SG reported a larger reduction in mean (SD) NPRS pain score [-3.09 (2.20)] from baseline, compared to the CG [-2.00 (1.41)]. However, multivariable linear regressions with or without

transformations revealed insufficient evidence of a statistical difference in NPRS score at 8 weeks when comparing the SG and the CG [-1.17; 95%CI: (-2.35, -0.01), R2 .19, p= .050].

Conclusion: Wearing a DEFO postpartum may assist to decrease pain and limit the impact of postnatal complications particularly for women starting with higher levels of pain. DEFO may be a useful non-pharmacological therapeutic option for the management of pain postpartum.

Key Practice Point:

- The use of SRC Recovery Shorts to manage common postpartum ailments during postnatal care could be considered as a possible intervention that is clinically well-accepted by participants and has high compliance.

## EFFECTIVENESS, FEASIBILITY AND ACCEPTABILITY OF DEFO FOR MANAGING PAIN, FUNCTIONAL CAPACITY, AND QoL DURING PRENATAL AND POSTNATAL CARE: SYSTEMATIC REVIEW.

Szkwara J<sup>1</sup>, Milne N<sup>1</sup>, Hing W<sup>1</sup>, Pope R<sup>1,2</sup>

<sup>1</sup>Bond University, Gold Coast, Australia, <sup>2</sup>Charles Sturt University, Thurgoona, Australia

Aim: To identify, critically appraise and synthesize key findings regarding the effectiveness, feasibility and acceptability of using (DEFO) to manage ailments during pre-natal and post-natal phases of care.

Design: Systematic review.

Method: Electronic databases (PubMed, CINAHL, EMBASE, Cochrane, PEDro) were used to identify relevant studies following the PRISMA procedure guidelines and applying an eligibility criterion. Eligible studies were sub-divided: 'prenatal' and 'postnatal' studies. Modified Downs and Black Checklist was used to determine the methodological quality. Data was extracted, summarised and critically appraised using a critical narrative synthesis approach to address our study aims.

Results: Seventeen studies (prenatal n=13; postnatal n=4) were included. Concerns surrounding the heterogeneity and methodological quality of the included studies were identified making it difficult to compare findings. Effectiveness: DEFO may have a role in the reduction of back pain in activities of daily living in prenatal and postnatal care; however, not all studies that reviewed quality of life found a significant difference. Feasibility and Acceptability: some evidence that pelvic belts can lead to skin discomfort while wearing the DEFO particularly during pregnancy. There are presently no studies in the postpartum period examining the feasibility and acceptability of using DEFO.

Conclusion: There is little available evidence to support the effectiveness, feasibility and acceptability of DEFO for managing pain and enhancing functional capacity and quality life during prenatal and postnatal care. Future research in this area is required.

Key Practice Point:

- Limited high-quality evidence to support or refute the value of DEFO in prenatal and postnatal populations.

## CHALLENGING CONVERSATIONS ABOUT EXERCISE AND PHLEGM WITH ADULTS DIAGNOSED WITH MOTOR NEURON DISEASE

**Tang L<sup>1</sup>**

<sup>1</sup>*Metro South Hospital and Health Service, Eight Mile Plains, Australia*

**Aim:** To determine the impact of physiotherapy interventions on adults with motor neurone disease (MND) referred to Chronic Disease Brisbane South multidisciplinary team.

**Design:** A seven-point Likert-type scale was used to measure and analyse qualitative data collected over a six-month period after the national disability insurance scheme was rolled out.

**Method:** All participants were referred by the Princess Alexandra Hospital MND clinic. Two team members (clinical nurse consultant and allied health assistant) recruited participants at random to complete the questionnaire. Families and individuals with MND who were not coping with the diagnosis were excluded from this study.

**Results:** A total of 17 participants were recruited. All participants agreed that they were contacted by the physiotherapist in a timely manner. 15 agreed that they have a better understanding of what is considered safe exercise limits. 14 agreed that they have a better understanding of using fatigue as a symptom to guide exercise intensity once reviewed by the physiotherapist. 13 agreed that they have a better understanding of how to clear phlegm and techniques demonstrated e.g. forced expiratory technique, breath-stacking, gravity-assisted drainage with positioning and use of mechanical insufflation-exsufflation devices. Challenges faced by these participants include contradictory advice received regarding exercise – “use it or lose it” vs. prioritization of activities, symptom management and energy conservation.

**Conclusions:** Physiotherapy interventions personalised to the individual with MND is necessary for effective support through the different stages of the disease.

**Key Practice Points:**

- Physiotherapists play a vital role within the multidisciplinary team in supporting adults with MND.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this study are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than that of the non-Indigenous population.

## THE EXTENT OF CULTURAL AND LINGUISTIC DIVERSITY AMONG PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD).

**Tang C<sup>1</sup>**, Lavercombe M<sup>2</sup>, Southcott A<sup>2</sup>, Taylor N<sup>3</sup>, Blackstock F<sup>1</sup>

<sup>1</sup>*Western Sydney University, Penrith, Australia*, <sup>2</sup>*Western Health, Footscray, Australia*, <sup>3</sup>*La Trobe University, Bundoora, Australia*

**Aim:** Despite the effectiveness of pulmonary rehabilitation (PR), people with Chronic Obstructive Pulmonary Disease (COPD) from a culturally and linguistically diverse (CALD) background rarely attend PR. The absence of cultural adaptation in current PR may be the reason why PR is poorly attended among this population. However, the extent of cultural and linguistic diversity among people with COPD and its implication to PR remain unknown.

**Design:** This is a prospective cohort study.

Method: Patients with COPD who attended the respiratory outpatient clinic at a metropolitan health service were recruited. Participants completed a questionnaire similar to the 2016 Australian Census with results descriptively analysed. Rates of referral, attendance and completion of PR were examined using a chi-square analysis.

Results: Among the 96 participants, 38 participants (45%) self-identified from a CALD background. 42% of the participants had an income of < \$25000/year and 68% did not complete Year-10 education. While there were no differences in attendance ( $p=0.19$ ) and completion rates of PR ( $p=0.36$ ) between CALD and non-CALD groups, people from non-CALD group were 4 times more likely ( $p=0.45$ ) to be referred to PR as compared to the CALD group.

Conclusion: People with COPD from a CALD background were significantly less likely to be referred to PR. Urgent strategies are required to increase referral rates to PR among people from CALD backgrounds.

Key Practice Points:

- COPD is prevalent among people from a CALD background.
- Patients with COPD from a CALD background were highly unlikely to be referred to PR

## PHYSIOTHERAPY MANAGEMENT OF INDIVIDUALS WITH DEMENTIA: AN UPDATE OF EPIDEMIOLOGY, RISK FACTORS, PHYSIOTHERAPY RESEARCH AND PRACTICAL MANAGEMENT STRATEGIES

Taylor M<sup>1,2,3</sup>

<sup>1</sup>Falls, Balance and Injury Research Centre, Neuroscience Research Australia, Sydney, Australia, <sup>2</sup>Prince of Wales Clinical School, Medicine, UNSW Sydney, Sydney, Australia, <sup>3</sup>Cognitive Decline Partnership Centre, Faculty of Medicine and Health, The University of Sydney, Hornsby, Australia

Managing older people is now core physiotherapy business across many health settings. With population ageing the number of people living with dementia is increasing rapidly, which has significant personal, health and economic impact. Modifiable risk factors for cognitive decline have been identified and physiotherapists are well placed to assist in managing many of these throughout the lifespan. Alzheimer's disease is the most common major neurocognitive disorder, but mixed dementia is also relatively common, particularly in older age. Dementia sub-types can present with different signs, symptoms and brain pathology. Core features of dementia include cognitive, functional and social impairments and psychological and behavioural symptoms. These impairments and symptoms can vary as the disorder progresses but can often be improved with non-pharmacological interventions. For example, physical activity/exercise has been demonstrated to improve, or at the very least delay decline in, physical and functional performance in older people with dementia. Understanding the person with dementia and tailoring physiotherapy treatment to their individual needs and environment is key to successful outcomes.

Key Practice Points:

- Gain insight into current dementia prevalence and incidence estimates in the context of population ageing
- Understand what factors contribute to the risk of developing dementia
- Gain a preliminary understanding of dementia subtypes and pathology
- Gain an understanding cognitive, physical and social impairments and behavioural and psychological symptoms in people with dementia
- Gain an understanding of the current evidence for physiotherapy management of dementia-related impairments
- Gain insights and practical strategies for physiotherapy management of individuals with dementia



## DEVELOPMENT AND EVALUATION OF PATIENT-REPORTED QUALITY INDICATORS FOR PHYSIOTHERAPY MANAGEMENT OF HIP AND KNEE OSTEOARTHRITIS (QUIPA) TOOL

**Teo P<sup>1</sup>**, Hinman R<sup>1</sup>, Egerton T<sup>1</sup>, Dziedzic K<sup>2</sup>, Kasza J<sup>3</sup>, Bennell K<sup>1</sup>

<sup>1</sup>University of Melbourne, Keilor East, Australia, <sup>2</sup>Keele University, Staffordshire, UK, <sup>3</sup>Monash University, Melbourne, Australia

**Aim:** Develop a patient-reported quality indicator for physiotherapy management of hip and knee osteoarthritis (QUIPA) tool and assess reliability and validity.

**Design:** Focus groups and psychometric property evaluation.

**Method:** To develop the QUIPA tool, prioritised guideline recommendations from a consensus study were revised and then further refined using patient focus groups. Test-retest reliability, construct validity (hypothesis testing) and criterion validity were then evaluated. Sixty-five patients with hip/knee osteoarthritis attended a single audio-recorded physiotherapy consultation and completed the QUIPA tool at one, twelve- and thirteen-weeks post-consultation. Individual treating physiotherapist (n=9) completed the tool post-consultation and one week later. An independent physiotherapist completed the tool for each consultation using the audio-recordings. Patient test-retest reliability was assessed between weeks twelve and thirteen. Construct validity was assessed with three predefined hypotheses and criterion validity based on agreement between patients, treating physiotherapists and independent physiotherapist.

**Results:** Thirty recommendations were extracted and revised to 23 items. The final QUIPA tool contained 18 items with modified wordings. The test-retest absolute kappa estimates for single items ranged 0.30-0.83 with observed agreement 64-94% and the absolute intraclass correlation coefficient (ICC) for total score was 0.80. All three predefined hypotheses were confirmed, however, agreement between patients, treating physiotherapists and independent physiotherapist for single items showed large measurement error and ICC for total scores  $\leq 0.55$ .

**Conclusion:** The QUIPA tool demonstrated inadequate reliability and criterion validity and needs further refinement and re-evaluation before recommending.

**Key Practice Points:**

- Potential use of the QUIPA tool to guide treatment but may not for benchmarking purposes.

## STRATEGIES FOR TREATING PARKINSON'S DISEASE IN THE AQUATIC ENVIRONMENT

**Terrens F<sup>1</sup>**

<sup>1</sup>Movement Disorders Program, Peninsula Health, Frankston, Australia

The principals of aquatic physiotherapy utilise the unique hydrostatic properties of water to influence human movement. Aquatic physiotherapy, or hydrotherapy, has been shown to be an effective treatment for individuals in several diagnostic groups but aquatic physiotherapy is not a common modality within the Parkinson's population. Although there are potential risks associated with aquatic physiotherapy for clients with PD, it is possible for clients to safely exercise in the pool environment. This presentation aims to educate physiotherapists on the impact PD can have on the cardiovascular and respiratory systems when immersed in water, and potential risks for clients. The primary aim is to highlight various different treatment techniques that can be used to maximise function for PD clients in the aquatic setting to improve clinician confidence, and to improve the utilisation of aquatic therapy in this population.

Key Practice Points:

- People with Parkinson's Disease are a vulnerable population in the aquatic environment, but it's possible for them to exercise safely
- An aquatic physiotherapy program should include specific exercises to improve trunk rotation, core strength and balance

## UNDERGRADUATE GRADE-POINT AVERAGE IS NOT A DETERMINANT OF STUDENTS' FUTURE PERFORMANCE IN A POSTGRADUATE ENTRY-LEVEL PHYSIOTHERAPY PROGRAM

**Terry R<sup>1</sup>**, Hing W<sup>1</sup>, Orr R<sup>1</sup>, Milne N<sup>1</sup>

<sup>1</sup>Bond University, Robina, Australia

**Aim:** Australian postgraduate entry-level physiotherapy programs commonly use undergraduate grade-point average (UGPA) to select students for admission. The aim of this study was to determine if students' UGPA is related to the future clinical and academic performance of postgraduate entry-level physiotherapy students.

**Design:** A retrospective cohort study.

**Method:** Student data from four consecutive cohorts (2010-2013) of an Australian postgraduate entry-level physiotherapy program (n = 123) informed this study. Data including UGPA, pre-clinical coursework marks and clinical performance scores as measured by the Assessment of Physiotherapy Practice were retrieved. Normality tests, descriptive analysis and correlations between UGPA, and mean pre-clinical coursework marks and clinical performance scores were calculated. Participants were then grouped according to UGPA and a one-way ANOVA was performed to determine differences in clinical or coursework performance between groups.

**Results:** Data from 121 students were analysed. No significant relationships were identified between students' UGPA and mean pre-clinical coursework or clinical performance scores. When students were classified by UGPA there were no significant differences in performance between groups.

**Conclusion:** UGPA was not a determinant of students' future performance in a postgraduate physiotherapy program.

Key Practice Points:

- Despite its common use as a selection criterion into postgraduate physiotherapy programs, UGPA was not related to students' future performance. This suggests the inclusion of non-academic criteria to select students into competitive programs should be considered. In addition, minimum UGPA entry requirements could be reviewed to ensure all applicants with the attributes for success in the physiotherapy profession are eligible for admission.

**Proposed Impact:** Traditional measures of achievement such as UGPA may discriminate against applicants from minority or low socio-economic groups. Competitive or needlessly high minimum UGPA requirements may prevent applicants with the attributes for success from accessing postgraduate physiotherapy education.

## PREDICTING SPECIALIST TACTICAL RESPONSE POLICE UNIT SELECTION SUCCESS USING THE URBAN RUSH, 2.4 KM AND 10KM LOADED CARRIAGE EVENTS

**Thomas R<sup>1</sup>**, Schram B<sup>1,2</sup>, Irving S<sup>2</sup>, Robinson J<sup>3</sup>, Orr R<sup>1,2</sup>

<sup>1</sup>Tactical Research Unit, Bond University, Robina, Australia, <sup>2</sup>Physiotherapy Program, Bond University, Gold Coast, Australia, <sup>3</sup>Australian Federal Police, Canberra, Australia

**Aim:** To determine whether performance on a loaded explosive occupational task (Urban Rush), or distance-based load carriage tasks (2.4 km or 10 km) were indicative of officer success on a specialist tactical response selection course (SSC).

**Design:** A retrospective cohort study

**Method:** Eighteen male police officers (mean age = 32.10±5.04 yrs; mean height = 183.72±5.79 cm; mean weight = 89.44±8.56 kg; mean Body Mass Index (BMI) = 26.45±1.58 kg/m<sup>2</sup>) participated in the SSC over 5 consecutive days. Data were categorised into: Group 1 (successful specialist selection applicants) and Group 2 (unsuccessful applicants). Independent sample t-tests, Pearson's correlations and a linear regression determined the differences and relationship between anthropometric and event performance data with alpha levels set at p=.05 a priori.

**Results:** Height (p=0.025), body weight (p=0.007) and 2.4km loaded March event performance (p=0.013) were significantly different between groups. All three performance measures were significant predictors of success accounting for 44% of the variance in outcomes, however, the 2.4km loaded march was the strongest (r<sup>2</sup> = 0.33) and only significant independent (adjusted r<sup>2</sup> = 0.29) predictor of success.

**Conclusion:** While a loaded 2.4km event is associated with success, a ceiling effect for an explosive anaerobic task and longer 10 km task may exist whereby increases in performance are not associated with selection success.

**Key Practice Points:**

- Police officers preparing for Tactical Response selection, therapists responsible for returning injured specialist tactical police for duty need to ensure that loaded 2.4 km events are included in candidate's and officer's work hardening practices.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population above that of the non-Indigenous population.

## PREDICTORS OF OUTCOME TO THE UPLIFT PROGRAM FOR PEOPLE WITH PERSISTENT BACK PAIN: A PROSPECTIVE COHORT STUDY – PRELIMINARY ANALYSIS

**Thomson H<sup>1,2</sup>**, Evans K<sup>3,4</sup>, Dearness J<sup>1</sup>, Bisset L<sup>4,5</sup>, Kelley J<sup>1</sup>, Conway K<sup>1</sup>, Morris C<sup>1</sup>, Scholten-Peeters W<sup>6</sup>, Cuijpers P<sup>6</sup>, Coppieters M<sup>5,6</sup>

<sup>1</sup>Gold Coast Hospital and Health Service, Gold Coast, Australia, <sup>2</sup>School of Medical Science, Griffith University, Gold Coast, Australia, <sup>3</sup>Faculty of Health Sciences, The University of Sydney, Sydney, Australia, <sup>4</sup>School of Allied Health Sciences, Griffith University, Gold Coast & Brisbane, Australia, <sup>5</sup>The Hopkins Centre, Menzies Health Institute Queensland, Griffith University, Gold Coast & Brisbane, Australia, <sup>6</sup>Amsterdam Movement Sciences, Faculty of Behavioural and Movement Sciences, Vrije Universiteit, Amsterdam, The Netherlands

**Aim:** Identify whether psychosocial variables predict outcome to a combined exercise and psychologically-informed education intervention (UPLIFT) for patients with persistent low back pain in a secondary healthcare setting.

**Design:** Prospective cohort study.

**Methods:** 121 participants completed ten questionnaires before and following the 5-week UPLIFT program, consisting of weekly 90-minute group sessions of interactive education and graded exercise. The questionnaires assessed psychosocial variables including fear avoidance, self-efficacy, treatment beliefs, catastrophising, perceived injustice, depression, anxiety and stress and social connectedness. Primary outcome was Global Rating of Change (GROC) upon completion and at 6-months follow-up.

**Results:** Immediately following UPLIFT, 47% of participants reported success (defined a-priori as GROC score  $\geq 3$ ); 36% reported improvement but smaller than considered clinically meaningful (i.e.,  $1 \leq \text{GROC} < 3$ ); 16% reported no improvement. There were significant reductions for catastrophising, disability, anxiety and stress, and perceived injustice ( $p \leq 0.001$ ). A reduction in depression, anxiety and stress was significantly correlated with high self-efficacy and lower depression, anxiety and stress at baseline.

**Conclusion:** A high proportion of patients reported clinically meaningful improvement immediately after the UPLIFT program. There was a strong association between patients with higher self-efficacy at baseline and significant improvements in disability, anxiety and stress scores following UPLIFT. Our follow-up data at 6 months will help determine whether these immediate improvements are sustained. Larger patient numbers in our trial (N=250) will allow the development of prediction models.

**Key Practice Points:**

- Patient and health service outcomes may be improved if outcome following UPLIFT could be identified more accurately and objectively at baseline.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## ‘HII (HIGH-INTENSITY INTERVAL)-SPEED’ CYCLING PROGRAM TO IMPROVE MOBILITY AND FUNCTIONAL OUTCOMES IN PATIENTS WITH PARKINSON’S DISEASE- FEASIBILITY AND PILOT STUDY.

**Ting E<sup>1</sup>**, McLoughlin J<sup>1</sup>, Barr C<sup>1</sup>

<sup>1</sup>College of Nursing and Health Sciences, Flinders University, Adelaide, Australia

**Aim:** Growing evidence supports speed-based cycling to improve motor function in people with Parkinson’s disease (PD). Previous protocols are impractical for use in community settings as they require mechanical

assistance. The aim of this study was to examine the feasibility a 'HII (High-Intensity Interval)-Speed' program on a standard exercise bike.

Design: Feasibility, pilot trial.

Method: Five participants with mild to moderate PD (Hoehn and Yahr stage 1-3) performed a 30-minute program on an exercise bike, which included 20 minutes of high cadence intervals (80-90 RPM), 3 times/week for 8 weeks. Feasibility measures included program retention, attendance, adverse effects, and ability to reach cadence without exceeding 80% heart rate maximum. Secondary pre/post outcomes included Time Up and Go, 10-metre walk test and Parkinson's disease Questionnaire - 39 (PDQ-39).

Results: Program feasibility was demonstrated with high attendance (98.1%) and retention rate (100%) with no adverse effects. All participants maintained the target cadence. Mobility scores were consistent. Improvement in PDQ-39 scores met the minimal detectable change of 5.31 points (13.86), with significant improvement in the cognitive dimension ( $p = .005$ ).

Conclusion: The 'HII-Speed program' was shown to be feasible in five individuals with mild to moderate PD. Larger studies should investigate the effect of this program on motor function in various stages of PD.

Key Practice Points:

- Patients with mild to moderate PD can safely complete the 'HII-Speed' cycling program on a standard exercise bike.
- This program can be performed in a community setting, supervised by a physiotherapist.

## OVERDIAGNOSIS OF LOW BACK PAIN

Traegar A<sup>1</sup>

<sup>1</sup>The University of Sydney, Sydney, Australia

Overdiagnosis occurs when people receive a diagnosis that does them more harm than good. Most major health areas (cancer, mental health, cardiovascular disease, and musculoskeletal conditions) face challenges with overdiagnosis. Low back pain, for example, is a common symptom that is often given a diagnostic label (slipped disc, pinched nerve, instability, degeneration, etc). This can be problematic because it is often not possible to reliably identify a specific tissue-based contributor to low back pain. These patients often experience no clinical benefit from their diagnosis, feel more worried because of it, and seek costly, invasive treatments with questionable efficacy. Other problems include disease mongering ("Pain as the 5th vital sign" campaign by US Veteran's Affairs), overutilisation (spinal injections, opioids), overdetection (from diagnostic imaging), overtreatment (spinal fusion surgery, early physiotherapy for acute low back pain), and false positives (red flags for serious pathology). This presentation will review our current understanding of overdiagnosis, and how this might affect clinical practice for physiotherapists. It will review recent research on using patient education to demedicalise low back pain and strategies to improve public understanding of overdiagnosis.

Key Practice Points

- Overdiagnosis is a major health challenge globally
- Physiotherapists often deal with the consequences of overdiagnosis but occasionally are part of the problem
- Understanding and communicating about overdiagnosis is an important skill for physiotherapists.
- Physiotherapists will play an integral role in empowering patients to ask questions of their clinician and resist care that is likely to bring them more harm than benefit

## A 2-YEAR PROSPECTIVE OUTCOMES OBSERVATIONAL STUDY OF GYM PARTICIPANTS POST CARDIOPULMONARY REHABILITATION

**Tran M<sup>1</sup>**

<sup>1</sup>*St Vincent's Hospital Melbourne, Fitzroy, Australia*

**Aim:** To study the outcomes of supported gym membership post hospital outpatient cardiopulmonary rehabilitation

**Design:** Prospective observational, single-cohort study

**Method:** Referral to gyms post cardiopulmonary rehabilitation from two sites of a metro hospital network. Cost-free 1 year gym membership, plus initial hospital staff support at the gyms, at four networks of local-council gyms.

**Results:** 74 participants were clinically assessed as suitable to be referred to the gym, mean age=65.25 [31, 88], 64% male. Diagnoses: 50% cardiac, 14% heart failure, 36% pulmonary. 65 commenced at the gym. 33 patients (45%) attended a 2 year follow-up assessment.

Further gains beyond hospital rehabilitation in 6MWT (n=26, mean improvement 53.27m, p=0.001) were observed at the 4 month follow-up in the gym and during the free membership period, while the Physical Component Score of the SF-36 (PCS) (n=25, mean change +0.16, p=0.954) and Mental Component Score (MCS) (n=25, mean change -2.4, p=0.447) remained stable.

6MWT reverted to baseline to pre-hospital rehabilitation status (n=30, p=0.434) at 2 year follow-up despite hospital rehabilitation and gym attendance combined. However, both PCS and MCS showed retained improvements (n=28, PCS mean change +17.6, p<0.001; MCS mean change +14.2, p<0.001).

**Conclusion:** That a wide age and demographic range of people with chronic cardiopulmonary conditions were suitable to be referred to the gym who show improved outcomes in 6MWT (shorter term) and maintained SF-36 (longer term) from their post-hospital outpatient rehabilitation episode. While financial support to overcome cost barriers did assist with membership uptake and allowed a further improvement in 6MWT, this was not sustained at 2 year follow-up once the free-membership period was over.

## MY BACK IS FRAGILE AND IT IS NEVER GETTING BETTER

**Travers M<sup>1,2</sup>**, Gibson W<sup>1</sup>, Hince D<sup>1</sup>, Darlow B<sup>3</sup>, Stanton T<sup>4</sup>, Moseley L<sup>4</sup>, Palsson T<sup>5</sup>, Murray J<sup>2</sup>, Hugosdottir T<sup>2</sup>, Tikoft E<sup>2</sup>, Murray J<sup>2</sup>, Wand B<sup>1</sup>

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**Aim:** To profile beliefs of fragility of the back and the resultant sense of threat in Australians with low back pain (LBP)

**Design:** Cross-sectional online survey.

**Method:** A novel 21-item questionnaire profiling beliefs regarding fragility of the back and the resultant sense of threat was developed based on qualitative LBP data and refined based external expert feedback and LBP patient feedback. The questionnaire was then deployed online using Qualtrics. Australian residents adults with LBP were recruited via social media, posters, links sent to private clinics and online forums.

**Results:** 201 respondents (mean age 42.3 (12.8)) completed the survey. Negative views regarding the fragility of their back and the irreversibility of their condition were prevalent in this sample. 51% of participants either agreed with the statement 'My back is fragile' and 61.7% agreed with the statement 'My back will never be the same again'. 77.6% of participants agreed with the statement 'My back pain tells me how much I can do'.

Conclusion: Australians with LBP harbour beliefs of structural fragility and irreversibility of their condition. Clinicians should consider such beliefs in their interactions with patients and should be careful not to perpetuate unhelpful structural / patho-anatomical beliefs. Future research should examine the source of these beliefs and their potential role as mediators of LBP.

Key Practice Points:

- Beliefs of structural fragility are common amongst people with LBP
- Many people believe the back is fragile structure
- Furthermore, they believe that their back pain is irreversible

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Negative beliefs, including an anatomical/structural cause of pain and pessimistic future outlook, are common amongst Aboriginal Australians with LBP. Our tool may be used to further explore this issue and facilitate the care of Aboriginal Australians with LBP.

## JUST LIFT IT.... DEMYSTIFYING STRENGTH TRAINING FOR PHYSIOTHERAPISTS

Travers M<sup>1</sup>

<sup>1</sup>University of Notre Dame Australia, Fremantle, Australia

Background: There is an increasing role for physiotherapists to prescribe exercise interventions across the population. However despite this pressing societal need, many physiotherapists lack the knowledge and confidence to effectively prescribe strength training exercises. Specifically, they report unfamiliarity with minimum exercise requirements and confusion regarding the specifics of exercise prescription parameters. Such confusion is understandable given a lack of formal intensive training in prescription strength exercise in many physiotherapy curricula, ambiguous and complex strength training literature and the intimidating nature of gym environments.

Objectives: To present a simplified model for the prescription of strength training in contemporary clinical practice.

Approach: A streamlined and user friendly approach to getting patients started with gym-based rehabilitation will be presented. This framework is based on synthesis of recent strength and conditioning literature and extensive clinical experience in gym-based rehabilitation.

There will be a strong emphasis on cutting through complexity and addressing strength training misinformation. Video based examples will punctuate this presentation and example programmes will be outlined to give the audience key take-home messages to immediately implement with confidence in their practices.

Key Practice Points:

Participants will learn:

- A simplified model for the prescription of strength training
- The current best evidence for optimising strength outcomes in patients
- How to prescribe efficient executable strength programmes

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: This framework has the capacity to enhance rehabilitation outcomes for all patients including Aboriginal and Torres Strait Islander people.



## PLATELET RICH PLASMA INJECTION IS EFFECTIVE FOR TENDINOPATHY – WHAT HAPPENS WHEN YOU REMOVE THE ACTIVE CONTROLS?

**Travers M<sup>1,2</sup>**, Murphy M<sup>1,3</sup>, Chivers P<sup>1</sup>, Bulsara M<sup>1</sup>, Debenham J<sup>1</sup>, Bagg M<sup>4,5</sup>, Palsson T<sup>6</sup>

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**Aim:** To highlight the need to consider the pooling of comparators, clinical diversity, comparisons to active control, risk of bias and confidence in the results when interpreting interventional systematic reviews and meta-analyses (SRMA) findings. We specifically sought to exemplify these points with a worked example comparing plate-rich plasma (PRP) injections with control injections for tendinopathy.

**Design:** Reproduction of a Meta-analysis with sensitivity analysis to account for active controls.

**Method:** We examined pooling of comparisons and clinical diversity, and conducted a sensitivity analysis on an existing meta-analysis to explore the effect of removing active controls (corticosteroid injections). Risk of bias was assessed using the Cochrane Collaboration's tool for assessing risk of bias.

**Results:** Most of the treatment effects reported in the included trials are unlikely to represent the true effect of the intervention. Furthermore, when comparisons with corticosteroid were removed the previously reported moderate treatment effect in favour of PRP was negated (SMD 0.25; 95% CI -0.16 to 0.65,  $p=0.23$ ).

**Conclusion:** This paper is not intended to suggest a true estimate of treatment effect of PRP for tendinopathy, rather it demonstrates the effect that an inappropriate control may have on the findings of an interventional SRMA.

### Key Practice Points:

- Clinicians should consider pooling of comparators, clinical diversity, comparisons to active control, risk of bias and confidence in the results when interpreting interventional SRMA findings
- Becoming better consumers of research evidence may allow clinicians to make sounder treatment choices

## NOT TOO LIGHT, NOT TOO HEAVY....GETTING THE INTENSITY RIGHT IN STRENGTH EXERCISES

**Travers M<sup>1</sup>**

<sup>1</sup>University of Notre Dame, Fremantle, Australia

**Background:** Resistance training has well documented effects in performance and rehabilitation settings. As such, physiotherapists could be well placed to prescribe strength training programmes for both treatment and prevention of many conditions. However, getting the intensity of strength training right for a given individual is a significant challenge. Prescribing as a percentage of one rep maximum can be time consuming and intimidating for many physiotherapists. Training to volitional fatigue is not recommended for many populations and basing intensity on rate of perceived exertion (RPE) can be highly inaccurate. So how can we provide an optimal strength stimulus, that is matched to the individual's capacity and minimise fatigue?

**Objectives:** To familiarise physiotherapists with and demonstrate the application of a Repetitions in Reverse (RIR) scale for determining intensity on a set by set basis.

**Approach:** The theoretical basis for the adoption of RIR in practice will be outlined via a brief overview of the research in this field. Emphasis will be on using this approach to match the load to the athlete's capacity and gauge intensity on a set-by-set basis.

Then, video examples will be presented to demonstrate the application of RIR in practice with key take-home messages for clinicians.

**Key Practice Points:**

Participants will learn:

- A the theoretical underpinnings of the Repetitions in Reverse scale
- How to practically implement it in their practice to optimise prescription of intensity in strength exercises
- Understand the shortcomings of other common methods for prescribing exercise intensity

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: This framework has the capacity to enhance rehabilitation outcomes for all patients including Aboriginal and Torres Strait Islander people.

## TRANSFORMING PRACTICE: A SPECIFIC NEUROBIOLOGICAL APPROACH FOR NECK PAIN OR TRAUMA ASSOCIATED WITH HEADACHE AND SENSORIMOTOR SYMPTOMS

Treleaven J<sup>1</sup>

<sup>1</sup>*Neck Pain and Whiplash Research Unit, SHRS, The University of Queensland, Brisbane, Australia*

Headache, dizziness, unsteadiness, and visual disturbances may present in patients with neck pain or potential neck trauma, (e.g. post whiplash, concussion). Possible neurobiological mechanisms for those symptoms include cervical, vestibular, visual, and autonomic and central nervous system impairments and their interactions. Differential diagnosis is vital if management is to be appropriate and best practice.

Research is informing the use and development of clinical tests to assist in the identification of cervicogenic causes or contributors to symptoms such as headache and dizziness as opposed to vestibular, visual, autonomic and central nervous system mechanisms. However, translation of this knowledge to the patient's benefit requires clinical skills in the patient interview and physical examination. Effective differential diagnosis to determine the precise role of cervicogenic contributions requires: (i) strong clinical reasoning to interpret the subtleties in symptom description, (ii) skilled physical examination techniques to accurately identify impaired function in the cervical articular, neuromotor and sensorimotor control systems and (iii) clinical skills to identify when other mechanisms such as vestibular, visual, autonomic and central nervous systems impairment are more likely, and may require timely referral to other specialties. Best practice and management requires knowledge and importantly, the clinical skills to implement the knowledge.

**Key Practice Points**

- The cervical spine is an important consideration in assessment of headache and sensorimotor control signs and symptoms.
- A skilled physical examination is vital.
- Evidenced directed cervical treatment is an important element in management.
- Knowledge of all potential mechanisms of symptoms is essential to direct management.

## WHAT IS THE EFFECT OF HEAD MOVEMENT ON THE INTERNAL CAROTID ARTERIES? IMPLICATIONS FOR MUSCULOSKELETAL PRACTICE

Truong D<sup>1</sup>, Innes D<sup>1</sup>, Langfield T<sup>1</sup>, Thomas L<sup>1</sup>

<sup>1</sup>*University of Queensland, St Lucia, Australia*

Aim: To measure excursion of internal carotid arteries during head movement and relationships to anatomical structures, particularly styloid process, to determine potential arterial strain.

Design: Observational ex-vivo study

Method: Four internal carotid arteries were exposed with blunt dissection. Arterial length (mm) was measured from the carotid bifurcation caudad to the sternal notch, distally to mastoid process, C1 transverse process, and styloid process. Change in length (%) indicating arterial strain from was compared between neutral and rotation, lateral flexion bilaterally and extension. Approximation of the arteries to surrounding structures was described.

Results: Greatest percentage change occurred at 55° ipsilateral rotation (12%,  $\pm 3$ ) and 30° contralateral lateral flexion (12%,  $\pm 2$ ) between the bifurcation and styloid process. Intra-rater reliability was good to excellent (ICC 0.86 to 0.9). The artery became visibly taut in ipsilateral rotation and stretched over the anterior C1 transverse process during extension.

Conclusion: Ipsilateral rotation, contralateral lateral flexion and extension appeared to cause greatest strain on the carotid artery, contrasting from head movements purportedly affecting vertebral arteries. Care should be taken with manoeuvres positioning the upper cervical spine in extension and ipsilateral rotation particularly in those with suspected carotid disease to minimize adverse events and by monitoring cerebrovascular symptoms. Future studies will validate these measures through imaging and compare with vertebral artery studies.

Key Practice Points:

- Ipsilateral rotation, contralateral lateral flexion and extension may place greatest strain on the internal carotid arteries in contrast to reported effects on vertebral arteries.
- Caution with cervical movements beyond 30° is advised where atlanto-axial instability or threats to internal carotid arterial integrity are suspected.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:

- Safe musculoskeletal practice of Aboriginal and Torres Strait Islander people, with particular attention to identifying risk factors for potential atherosclerotic changes.

## GIRLS WITH OVERWEIGHT OR OBESITY HAVE MORE DIFFICULTY WITH POSTURAL CONTROL, BUT ONLY DURING CHALLENGING BALANCE TASKS

**Tsiros M<sup>1</sup>**, Brinsley J<sup>1</sup>, Mackintosh S<sup>2</sup>, Thewlis D<sup>3</sup>

<sup>1</sup>Alliance for Research in Exercise, Nutrition and Activity, School of Health Sciences, University Of South Australia, Adelaide, Australia, <sup>2</sup>School of Health Sciences, University of South Australia, Adelaide, Australia, <sup>3</sup>Centre for Orthopaedic & Trauma Research, Adelaide Medical School, The University of Adelaide, Adelaide, Australia

Aim: To investigate associations between adiposity and postural control in 8-10-year-old girls. This novel study is important as adiposity is linked with reduced motor skills and physical activity, but links with balance are unclear and have been rarely investigated in girls.

Design: Cross-sectional

Method: Girls (N = 47) who were healthy-weight, overweight or obese according to their body mass index (BMI) percentile completed six postural control tasks (standing with malleoli touching, tandem stance leading with dominant/non-dominant foot, eyes open/closed). Centre of Pressure (COP) sway area, principal/minor axis length and maximum velocity were calculated from ground reaction forces (AMTI force platform using Visual 3D™). Data were analysed with linear mixed models. The University of South Australia granted ethical approval.

Results: During tandem stance, higher BMI was associated with greater sway area (non-dominant foot eyes closed  $p = 0.03$ ) and greater principal axis length (non-dominant foot eyes closed  $p = 0.03$ ; dominant foot eyes open  $p = 0.05$ ). There were significant interactions between BMI percentile and task difficulty to predict postural control (sway area, principal/minor axis length and maximum velocity), notable in tandem stance positions ( $p \leq 0.04$ ), especially in the non-dominant foot eyes closed position ( $p \leq 0.02$ ).

Conclusion: Girls with higher adiposity may have impaired postural control when performing challenging balance tasks. Adiposity is unlikely to play a role during easier balance tasks.

Key Practice Points:

- Girls with overweight/obesity may have additional functional/safety considerations when performing more challenging balance tasks
- Assess adiposity when evaluating balance in girls

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: Postural control and body composition are important developmental considerations for Aboriginal/Torres Strait Islander people, although it is unknown if our findings are directly generalisable to Aboriginal/Torres Strait Islander people.

## EVOLUTION OF ANTERIOR CRUCIATE LIGAMENT REHABILITATION MODEL OF CARE: COMPARISON OF SERVICE METRICS AND PHYSIOTHERAPIST UTILISATION OF EVIDENCE-BASED OUTCOME MEASURES

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<sup>1</sup>QEII Jubilee Hospital, Brisbane, Australia, <sup>2</sup>EBM Analytics, Sydney, Australia

Aim: Compare service metrics and physiotherapist utilisation of evidence-based outcome measures pre and post an anterior cruciate ligament rehabilitation model of care change in a public hospital.

Design: Retrospective cohort study

Method: A phase-based, outcome measure guided anterior cruciate ligament rehabilitation model of care was introduced. Charts of 132 patient were reviewed who underwent anterior cruciate ligament reconstruction and rehabilitation at QEII Hospital pre ( $n=96$ ) and post ( $n=36$ ) model of care change. Outcomes included: attendance, completion rates, physiotherapist utilisation of evidence-based outcome measures.

Results: The new model of care cohort attended more sessions (median 10.5 IQR 8-15 vs 8, 4-12,  $p = 0.001$ ), yet demonstrated no change in failed to attend rates (29% vs 26%,  $p = 0.46$ ). Assessment of kinetic chain strength (83% vs 43%,  $p < 0.001$ ) and single leg squat increased (86% vs 63%,  $p = 0.01$ ) post model of care change. Rehabilitation completion rates (33% vs 37%,  $p = 0.89$ ), assessment of quadriceps (72% vs 52%,  $p = 0.09$ ) and hamstrings (58% vs 49%,  $p = 0.43$ ) strength, and hop test (55.6% vs 44.7%,  $p = 0.27$ ) did not differ.

Conclusion: A phase-based, outcome guided anterior cruciate ligament rehabilitation model of care achieves increased attendance and increased utilisation of certain evidence-based outcome measures. It does not impact failed to attend or rehabilitation completion rates.

#### Key Practice Points:

- A phase-based, outcome guided anterior cruciate ligament model of care can improve attendance and physiotherapist utilisation of certain evidence-based outcome measures.
- Public hospital anterior cruciate ligament rehabilitation completion rates are poor.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:

While not directly impacting Aboriginal and Torres Strait Islander people, this model of care could have a positive impact on patients accessing the public hospital system, including Aboriginal and Torres Strait Islander people.

## WHAT IS THE REPORTED ROLE OF THE THERAPIST IN VIRTUAL REALITY-BASED REHABILITATION INTERVENTIONS ADDRESSING MOBILITY LIMITATIONS? A SYSTEMATIC REVIEW

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**Aim:** To determine the reported clinician role in delivering virtual reality-based interventions to address mobility limitations in rehabilitation.

**Design:** Systematic review.

**Method:** MEDLINE, CINAHL, Cochrane, SCOPUS and EMBASE were searched from 2007 for full-text studies. Studies were included if they were interventional by nature, primarily aimed at improving functional mobility in >10 participants, using commercially available virtual reality-based technologies, and conducted in a supervised rehabilitation setting.

**Results:** The search identified 29 eligible studies. The intervention was provided by physiotherapists (n=15), therapy assistants (n=3), occupational therapist (n=1) or a profession was not explicitly stated (n=11). Mode of delivery was reported as individual (n=7), individual and paired (n=1) or not detailed (n=21).

Twenty-two studies reported one or more therapist roles. Supervision (n=12) and safety (n=8) were most frequently reported, often without further elaboration. Few studies reported additional detail, including program selection (n=5), feedback provision (n=4), education (n=3), motivation (n=3) and intervention recording (n=2).

**Conclusion:** Virtual reality-based rehabilitation interventions were primarily provided by physiotherapists, with supervision and safeguarding reported as key therapist roles. Fewer studies reported clinically complex physiotherapist input, however this may be an issue of under-reporting. Future research could examine how physiotherapists can best apply their clinical skills to optimise virtual reality-based intervention delivery.

#### Trial Registration

PROSPERO(CRD42018105668)

#### Key Practice Points:

- When implementing virtual reality-based interventions, physiotherapists should consider utilising their clinical skills to prescribe task-specific programs and provide client-centred additional feedback (e.g. manual guidance).
- If virtual reality-based interventions require only supervision for safety they could possibly be provided by physiotherapy assistants.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: It is proposed that this research has the same impact on the Aboriginal and Torres Strait Islander population and the non-Indigenous population.

## TECHNOLOGY AND OLDER PEOPLE

VandenBerg M

The availability of new technologies in rehabilitation practice is rapidly increasing, with remarkable advances in virtual reality-based therapy, rehabilitation robotics, wearable devices and digital health technologies. Research has shown that technology-enhanced interventions can be used successfully to increase dose of practice, provide feedback, monitor exercise programs and manage chronic conditions. Many of these devices are inexpensive and have been shown to increase engagement and enjoyment. With a shift towards community-based rehabilitation, new technology-based interventions also have the potential to improve access to rehabilitation services and increase dose of home-based practice. Older adults are increasingly using technology and adapting to the use of technology in rehabilitation, such as smartphones or tablets, which can be used to monitor and aid rehabilitation.

### Key Practice Points:

- This presentation will provide a rapid overview of available technologies used in clinical rehabilitation, underlying principles for the use of these technologies and examples of latest evidence to support their use, with a focus on geriatric and neurological rehabilitation.
- Acceptance of technology use, by clinicians and patients, will be discussed.
- Finally, considerations for incorporating technologies in clinical practice will be identified.

## RESPIRATORY PHYSIOTHERAPY FOR INTUBATED AND MECHANICALLY VENTILATED ADULTS WITH PNEUMONIA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Aim:** To determine the effect of respiratory physiotherapy for invasively ventilated adults with pneumonia on outcomes of mortality, functional recovery, quality of life, length of stay, duration of ventilation, oxygenation, secretion clearance, pulmonary mechanics, and rate of adverse events.

**Design:** Systematic review with meta-analysis.

**Method:** Four databases were searched for randomised trials, published between January 1995 and November 2018, involving invasively ventilated subjects with pneumonia who received respiratory physiotherapy intervention. Study quality was assessed using a standardised critical appraisal tool from the Joanna Briggs Institute. Review Manager was used to pool studies and the GRADE system was used to evaluate level of certainty.

**Results:** Fourteen trials (463 total subjects) were identified. Eight had data that could be pooled for meta-analysis. An overall effect favouring intervention was found for techniques that increased inspiratory volume on secretion clearance [mean 1.97 g (95% CI 0.80 to 3.14)] and lung compliance, both immediately after treatment [mean 5.40 mL/cmH<sub>2</sub>O (95% CI 2.37 to 8.43)] and after a 20-30 minute delay [mean 6.86 mL/cmH<sub>2</sub>O, (95% CI 2.86 to 10.86)]. However GRADE certainty of evidence was very low for each outcome

due to small sample sizes and mixed diagnoses other than pneumonia included in trials. Adverse event rate was low.

Conclusion: Techniques that increase inspiratory volume appear safe and benefit secretion clearance and lung compliance. Translation of these benefits for patient centred outcomes is unclear and further research is needed.

Key Practice Points:

- Invasively ventilated patients with pneumonia may benefit from respiratory techniques that increase inspiratory volume.

## CLINICAL VALIDATION OF EXPERT CONSENSUS STATEMENTS FOR RESPIRATORY PHYSIOTHERAPY MANAGEMENT OF INVASIVELY VENTILATED ADULTS WITH COMMUNITY ACQUIRED PNEUMONIA.

van der Lee L<sup>1,2</sup>, Hill A<sup>3</sup>, Patman S<sup>1</sup>

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Aim: To undertake multidisciplinary peer-review of expert consensus statements for further development into clinical practice guidelines.

Design: Qualitative.

Method: Focus groups (n = 3) were conducted with representatives from five Australian states. Participants were senior ICU physiotherapists, and one multidisciplinary group. The consensus statements (covering domains of assessment, prioritisation, positioning, hyperinflation, manual techniques, saline instillation and mobilisation) were reviewed. Thematic analysis was used, with a deductive approach to confirm clinical validity, and inductive analysis to identify new themes relevant to clinical application.

Results: Senior ICU clinicians from physiotherapy (n = 16), medicine (n = 6) and nursing (n = 4) participated. All concurred that the consensus statements added valuable guidance to practice. Twenty-nine (76%) were deemed relevant and applicable, with modifications suggested for nine to enhance utility. Overarching themes identified as influencing clinical application were patient safety, teamwork and communication, and culture. Cultural differences in practice, particularly related to patient positioning, were evident between Perth and the eastern states of Australia. Participants raised practicality and safety concerns for statements regarding the use of head-down patient positioning.

Conclusion: Peer-review by multidisciplinary stakeholders established clinical validity of expert consensus statements for implementation with invasively ventilated adults with pneumonia.

Key Practice Points:

- Participants concurred that the consensus statements were valuable for clinical practice and can be developed into clinical practice guidelines.
- Nine statements required some clarification or explicit further commentary to allow successful translation across different unit cultures.
- Further research around safety of head-down positioning is warranted to assist translation.



## LASER ACUPUNCTURE (PBM) IN THE MANAGEMENT OF CRPS

Varigos E

This presentation will focus on the treatment of CRPS (Complex Regional Pain Syndrome) which is a nerve related pain syndrome that affects the upper or lower limb after injury (even minor), or surgery. The combination of nerve pain, an abnormal Autonomic Nervous System, oedema and associated motor dysfunction makes it a very disabling condition for patients.

It is a pain condition that is very difficult to manage even with a multimodal approach, including interventional techniques such as sympathectomy, and patients often require treatment and management at Multidisciplinary Pain Clinics.

I will discuss the clinical effect of using laser acupuncture as part of the treatment management of CRPS. This will include:

- The clinical pre and post treatment assessment of these patients
- The early intervention
- The strong responder and patient sensitivity to laser acupuncture
- The selection of useful acupuncture points I include as part of the treatment and management.

From my clinical experience I believe laser acupuncture is a safe and effective method of treating CRPS and warrants further research studies.

## LASER ACUPUNCTURE (PBM) IN THE PERIOPERATIVE MANAGEMENT OF SURGERY

Varigos E

Photobiomodulation (PBM) is a safe, non-invasive and easy to administer therapy. It is the application of low level red and/or near infrared light to biological tissue.

The application of particular wavelengths of light onto cells has been shown to induce physiological changes, including at the mitochondrial level where photons are absorbed in Cytochrome C Oxidase.

Though the exact mechanisms of PBM cellular interaction continues to be studied, clinical experience for over 40 years indicates the therapy to have efficacy – primarily in the treatment of inflammation, chronic joint swelling, oedema and pain reduction. PBM has been advocated for the improvement of wound healing and tissue regeneration. Some studies have also reported it can help alleviate anxiety.

The peri-operative period is often a difficult time for patients.

If times persists this presentation will include some studies on acute post-surgical pain outcomes and the development of chronic pain; Anxiety and catastrophising have been shown to be a major risk factor for increasing acute post-op pain; Certain surgical sites have been found to have a higher incidence of developing chronic pain. Post-op mortality and morbidity statistics will be highlighted. Post-operative prescribing of opioids has exponentially increased in recent years, not only has this had a significant impact on overdose deaths in the community (The Opioid crisis) but it has also had an influence on surgical patients recovery. A brief outline of treatment options will be discussed. It should be noted that there is no specific protocol, as treatments require individualisation to each patient. As time allows several short case presentations adding PBM to treatment will illustrate a reduction in pain, swelling and anxiety and opioid consumption. As a result of this there will often be improved function, mobility and enhanced surgical recovery.

## NATIONAL RECOGNITION OF ADVANCED MUSCULOSKELETAL PHYSIOTHERAPISTS

Vine K<sup>1</sup>

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**Aim:** Australian advanced musculoskeletal physiotherapists work in roles traditionally performed by other health professions (medical specialists). These physiotherapists have undertaken further education and training but no national standard currently exists. This presentation provides an update on the development of a nationally recognised standard of practice.

**Design:** A descriptive report on the recommendations of a national expert panel.

**Method:** In 2017 the Australian Physiotherapy Association Board approved and provided ongoing support of a national advisory panel of advanced musculoskeletal physiotherapists to review and develop national standards of practice for individuals in advanced musculoskeletal physiotherapy roles.

**Results:** The panel has developed a nationally applicable standard of practice and associated education and training pathway for advanced musculoskeletal physiotherapists. The standard outlines competency based criteria for use in the musculoskeletal setting including the emergency department, orthopaedic, spinal, rheumatology and post-arthroplasty clinics. The view is that national endorsement from the Australian College of Physiotherapists will be available to appropriate individuals. The model has application in other areas of the Physiotherapy profession.

**Conclusion:** A consistent national standard of practice and endorsement will mitigate risk and facilitate improved safety for patients. It will improve professional recognition, recruitment, retention and transferability for the AMP workforce.

**Key Practice Points:**

- A national standard of practice and endorsement for advanced musculoskeletal physiotherapists is recommended.
- The model has implication for other areas of physiotherapy practice.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:**  
No specific impact is anticipated.

## PHYSICAL ACTIVITY IN OUTSIDE SCHOOL HOURS CARE: AN OBSERVATIONAL STUDY.

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**Aim:** Approximately 1 in 10 Australian children attend Outside School Hours Care (OSHC). The outside school hours period is an opportune time for children to be active, however little is known about activity behaviours in this setting. The aim of this study was to describe children's physical activity behaviours in OSHC and identify opportunities to improve activity and motor development.

**Design:**  
Observational, cross-sectional study.

**Method:**  
Randomly selected OSHC services across metropolitan Adelaide were invited to participate. Children's activity was observed in an after-school care session using the System for Observing Play and Leisure

Activity in Youth (SOPLAY). Structured interviews were conducted with Directors to evaluate current policy, practices and infrastructure relating to physical activity.

Results: Twenty-three services participated (n= 1068 children). On average, children were sedentary 61% of the session, in light physical activity 21% and moderate-to-vigorous physical activity (MVPA) 18% of session time. The most common types of MVPA included unstructured play (running, jumping, hopping), playground play (climbing, swinging, sliding) and soccer. Directors highlighted a lack of guidelines for physical activity practices.

Conclusion: Children spend majority of their time in after-school care sedentary. There is a need for guidelines, which may improve children's activity behaviours and motor skill development.

Key Practice Points:

- The hours before and after school are critical opportunities for children's physical activity and motor development.
- Australian children spend most of after-school care sedentary, with a need for guidelines to inform activity behaviours.
- OSHC staff should encourage MVPA activities such as free playground play and ball games to encourage physical activity and motor development.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:

The results of this research are not likely to have greater impact on Aboriginal and Torres Strait Islander population than that of the non-Indigenous population.

## GLUTEAL AMNESIA: HOW TO RE-ACTIVATE THE GLUTEAL MUSCLES IN THE PRESENCE OF GLUTEAL TENDINOPATHY.

Wajswelner H<sup>1</sup>

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Background: Gluteal Amnesia (GA) is the inability to activate the gluteal muscles effectively, particularly the gluteus medius muscle. It is seen in conditions that cause buttock pain, lateral hip pain (gluteal tendinopathy), chronic pelvic, hip joint, knee joint and back pain. GA causes functional impairments such as gait disturbance, pain with prolonged sitting, sleep disturbance, difficulty in sit to stand and stair climbing. Reactivation is a crucial goal in hip, lower limb and spinal rehabilitation.

Aims: The aim is to demonstrate novel techniques for re-activation, particularly of Gluteus Medius, shown to be effective in a recently published randomised controlled trial. The learning outcomes include a knowledge of effective exercises for gluteal re-activation, a knowledge of optimal starting positions, an expanded repertoire of exercise options, skills in providing cues to enhance gluteal motor control, skills in exercise progression and utilisation of different exercise domains eg isometrics, functional, theraband, pilates.

Approach: A series of exercises will be displayed and explained in a progression, from very early re-activation to strength building and functional exercises. Various methods to enhance re-activation such as use of the unaffected side, mental imagery, tactile feedback, hip joint re-positioning, adding resistance and using simple props such as belts, bands and the Glute Rack will be demonstrated. New ways of executing traditional exercises such as the squat will be demonstrated, in order to activate the gluteal muscles rather than the quadriceps. The learning approach is show videos with detailed explanation of cueing and progressions of these exercises, and to actively participate in some of these within the limitations of the teaching forum.

Key Practice Points:

- The knowledge and skills acquired in this session will contribute to participants' ability to effectively correct GA and manage painful conditions of the hips, back and knees that are driven by poor gluteal function.

## THE LIVED EXPERIENCE OF PROVIDING ALLIED HEALTH SERVICES UNDER THE NATIONAL DISABILITY INSURANCE SCHEME IN A RURAL AREA

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**Aim:** To explore in-depth the lived experience of providing allied health services under the National Disability Insurance Scheme

**Design:** Qualitative research guided by phenomenology of practice

**Method:** Purposive sampling was used to recruit eight rural-based allied health NDIS service providers. Semi-structured interviews were conducted, audio-recorded, and transcribed verbatim and their lived experience accounts analysed thematically.

**Results:** Study participants were from the disciplines of physiotherapy, nutrition and dietetics, speech pathology and occupational therapy. Three themes emerged: Beyond my depth encompassed the shift of service provider roles from therapist to advocate. A sea of uncertainty described participants' frustration at inconsistencies in the allocation of resources for clients and Drowning in the wave described the concerns participants expressed in coping with the increase in service demand. Through further reflection on the themes and participants' accounts, the essence of the phenomenon was illuminated and was described as powerlessly facing the wave of change.

**Conclusions:** Overwhelmingly, these accounts from rural allied health clinicians were negative, frustrated and disillusioned. Service providers felt that with the implementation of the NDIS, the needs of their rural-based clients, and the service providers themselves, were not being met.

Key Practice Points:

- Service providers in this study reported the National Disability Insurance Scheme currently does not suit the needs of rural service providers or their clients.

**Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander People**  
The findings of this research may be of relevance to providing services under the National Disability Insurance Scheme to Aboriginal and/or Torres Strait Islander communities in rural areas.

## THE LIVED EXPERIENCE OF ABORIGINAL MOTHERS PARENTING A PREMATURE INFANT IN A RURAL AREA

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**Aim:** To explore in-depth the lived experience of Aboriginal mothers parenting a premature infant in a rural area.

**Design:** Qualitative research informed by phenomenology of practice.

**Method:** Following extensive community consultation Aboriginal mothers were engaged in interviews about their experiences parenting a premature infant in rural New South Wales. Interviews were recorded and transcribed verbatim. Data were analysed thematically in consultation with Aboriginal research assistants.

**Results:** Participants were four Aboriginal mothers who were parenting children born between 26- and 33-weeks gestation. Two families resided in a regional town and two in a remote area. Themes emerging from the analysis were Disconnection which encompassed participants description of feeling disconnected from home, family, health services and support and Connection, which contained participants descriptions of establishing connections with Community in order to cope with this parenting experience.

**Conclusions:** It is concerning that these mothers reported feeling disconnected from the services designed to support them. There is a need for physiotherapy and other services supporting families with premature infants to understand the experience of Aboriginal families in order to more effectively meet their needs.

**Key Practice Points:**

- Participants in this study experienced stressors and barriers to parenting particular to residing rurally and particular to identifying as Aboriginal.
- Aboriginal mothers in this study felt disconnected from their usual support networks and from health services aiming to support them.

**Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander People**

This research seeks to bring greater understanding and awareness of the experience of Aboriginal mothers in rural areas parenting premature infants. Through greater understanding, it is hoped that physiotherapists working with these families can more effectively meet their needs.

## **SCALING-UP EVIDENCE INTO PRACTICE: INVESTIGATING THE SYSTEM-WIDE SPREAD OF A COMPLEX INTERVENTION FOR OSTEOARTHRITIS (ESCAPE-PAIN) IN ENGLAND**

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**Aim:** To investigate the system-wide implementation of a complex intervention for osteoarthritis (Enabling Self-management and Coping with Arthritic Pain using Exercise, ESCAPE-pain) in England.

**Design:** A mixed methods approach using the Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) framework.

**Method:** Reach, adoption and effectiveness were determined using routine monitoring data collected by a clinical-academic network. Factors relating to implementation and maintenance were explored via in-depth interviews with 40 physiotherapists and managers from 13 organisations in England delivering ESCAPE-pain. Qualitative data were analysed using thematic analysis.

**Reach:** Between 2014-2019 >11,000 people participated in ESCAPE-pain.

**Effectiveness:** Clinical effectiveness has been maintained in "real world" settings. Mean changes on Knee Injury and Osteoarthritis Outcome Score were: pain 7.6% (CI 7.2 to 8.1), function 8.2% (CI 7.7 to 8.7) and quality of life 8.1% (CI 7.5 to 8.6). P<0.001 for all scores.

Adoption: ESCAPE-pain has been adopted by 170 sites (97 clinical; 73 non-clinical/community). It is delivered predominately by physiotherapists; however, an increasing number of exercise professionals are delivering ESCAPE-pain.

Implementation and maintenance: ESCAPE-pain was adopted for national scale-up by a network of formal clinical-academic collaborations. Strategies used to achieve scale-up include developing a nationally accredited training scheme, expanding the type of settings and professionals delivering the intervention. There were tensions between adaptation and fidelity to the intervention's core components from pressure to deliver short-term cost-savings and staff turnover.

Conclusion: A complex intervention for osteoarthritis has been successfully implemented at scale into "real world" settings.

Key Practice Points:

- Scaling-up has been a planned process requiring sustained, dedicated resources
- Packaging knowledge (e.g. dedicated website, training) about ESCAPE-pain allowed providers see its benefits and how to implement it.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander peoples: As a UK-based project the impact for these peoples is unclear.

## ACTIVE WOMEN OVER 50 RANDOMISED CONTROL TRIAL

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Aim: To test the impact of a low-cost, scalable intervention, involving education, activity tracker and follow-up email support on physical activity in women aged 50+.

Design: Randomised waitlist-controlled trial with concealed allocation.

Method: The intervention group, 65 female university and healthcare staff not currently meeting national physical activity guidelines, received a one-hour education session with follow-up email support and activity tracker loan for 3 months. The wait-list control group (n=61) received the intervention after completing 3 month follow-up.

Outcome measures: Primary outcome was proportion of people achieving  $\geq 10,000$  daily steps, objectively measured at follow-up. Secondary outcomes were proportion of people achieving national guideline-recommended physical activity, estimated energy expenditure from self-reported hours of weekly physical activity, perceived benefits of and barriers to exercise participation, physical functioning, and mood. The intervention group gave program feedback at follow-up.

Results: 103 participants (82%) completed follow-up. At follow-up, all intervention participants had investigated/ implemented  $\geq$  one of the resources/strategies suggested in the intervention and planned to increase their physical activity over the next 6 months. Forty-two intervention participants (79%) used technology to support their physical activity, 39 (74%) set physical activity goals, of which 35 people (90%) partially/fully achieved them. We detected no between-group differences at follow-up on primary and secondary outcomes.

Conclusion: Despite being well received by intervention participants the 'Active Women over 50' program did not improve physical activity and other trial outcomes.

Key Practice Points:

- Education, email support and an activity tracker alone do not improve physical activity in women aged 50+

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population than the non-Indigenous population.

## RELIABILITY OF THE BLECK'S MEASUREMENT IN CHILDREN 0-4 YEARS WITH METATARSUS ADDUCTUS

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The Bleck heel bisector method is the most commonly cited measurement technique for determining severity and flexibility of the metatarsus adductus foot. It is clinically utilised to guide conservative treatment decisions for this common congenital foot deformity seen in newborns, however no previous studies have assessed the reliability of this assessment method.

Design: This reliability study investigates the inter and intra-rater reliability of the Bleck's severity and flexibility measurement when assessing children aged zero to four years with metatarsus adductus.

Methods: Two independent experienced raters clinically assessed the severity and flexibility of metatarsus adductus at one point in time. Photographs and video were taken at the assessment session and reviewed a minimum of 3 weeks later to assess intra-reliability.

Results: 25 feet were assessed (mean age 15.5 months). The inter-rater reliability of Bleck's severity assessment demonstrated moderate to good reliability (weighted kappa  $k=0.56$  in clinical setting and  $k=0.77$  via photograph). Intra-rater reliability and reliability of flexibility measures were all poor  $k < 0.29$ .

Conclusion: The Bleck severity assessment measure is reliable when using both clinical observation and a photograph of foot position for the condition metatarsus adductus with regards to inter-rater reliability. Caution should be undertaken when interpreting the results of Bleck's flexibility assessment.

Key Practice Points:

- Clinicians should consider the use of photographs to assess for severity of metatarsus adductus using Bleck's measure.
- Despite poor reliability of Bleck's flexibility measure, rigid cases are clinically clear and should be treated following current best practice guidelines.



## A COMPARISON OF SENSITIVITY AND SPECIFICITY OF THE SOUTH AUSTRALIAN MOTOR ASSESSMENT TEST AND THE MOVEMENT ASSESSMENT BATTERY FOR CHILDREN-2

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Developmental Coordination Disorder (DCD) affects approximately 5% of children. Screening and diagnostic tools can be time consuming and/or expensive. The South Australian Motor Test (SAM) is a low cost assessment which is considered time efficient for assessing motor impairment in children.

Design: This cross-sectional cohort study determined the psychometric properties of sensitivity and specificity for the SAM compared to the Movement Assessment Battery for Children 2nd Edition (MABC-2) and also considered feasibility factors.

Methods: Children (n=560) aged 5-8 years were invited to participate in this study from five primary schools across metropolitan South Australia. Of those who consented, participants were then assessed using the MABC-2 and then the SAM and test duration was recorded.

Results: One-hundred and seventy-three children (93 males), mean age of 6 years 0 months, were eligible and consented for the study. 46 children were diagnosed with DCD. The SAM had a sensitivity of 0.8636 and a specificity of 0.5354 compared to the MABC-2. The mean duration of the MABC-2 was 20 minutes 23 seconds and for the SAM it was 4:34 minutes.

Conclusions: The South Australian Motor Assessment Test is an effective screening tool for determining if a 5-8 year old child has a motor impairment especially when screening large populations where time restrictions are a factor.

Key Practice Points:

- The SAM provides a sensitive, cost and time efficient alternative screening tool for identifying children with a motor impairment. These feasibility factors are important to consider due to the time constraints placed on health professionals and teachers.

## THE INFLUENCE OF EDUCATION IN DECISION MAKING CONCERNING ATHLETE'S RETURN TO SPORT FOLLOWING A CONCUSSION INJURY: A SYSTEMATIC REVIEW.

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Aim: the effects of education and knowledge on the decision to Return to Sport (RTS) following a concussion injury.

Design: A Systematic review.

Methods: The literature review was performed in Pubmed, CINAHL, SPORTDiscus, Embase, and Web of Science looking for articles that discussed concussions and any three of the four following: decision-making; education/knowledge; sport/ return to sport; and risk.

Results: The search yielded 16 relevant studies: 10 cohort studies, four cross sectional studies and two qualitative research studies. There is a good level of evidence to support education's impact on athletes when reporting concussion-like symptoms and abstaining from play. It has been revealed that a more

complicated process between knowledge of concussions, risk assessment, and the significance of sports occurs with decisions to RTS.

Conclusion: Education can make a difference in athlete's decision-making process to RTS, however their awareness of the health risks that they put themselves in by returning to sport too soon is influenced by other internal and external factors.

Key Practice Points:

- The difference that education makes to an athlete's decision-making process when returning to sport is complex and is influenced by internal and external factors.
- There is a paucity of studies that have investigated risk aversion in athletes, which is important for medical practitioners and team support personnel to understand to help guide these athletes in their RTS decision-making process.
- It is currently unknown how risk averse/seeking behaviours affect the decision to RTS following a concussion injury.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The findings of this review have direct relevance to anyone participating in sport from the Aboriginal and Torres Strait Islander Population.

## WHY RISK IT? A PILOT STUDY ON ATHLETES RETURN TO SPORT DECISIONS FOLLOWING CONCUSSION INJURIES AND THE INFLUENCE OF EDUCATION

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Aim: The aim of this study was to explore the influence of education and other factors on an athletes' decision to return to sport (RTS) post-concussion injury, and whether general risk-taking tendencies are related to RTS post-concussion decisions in athletes.

Design: A self-administered electronic survey was purposely designed to examine their decision-making process when faced with scenario-based questions regarding RTS post-concussion injury.

Method: Students from the Health Sciences and Medicine Faculty at Bond University were invited to participate. Participants were randomly allocated to a concussion education or non-education group via the random generator on Qualtrics software function. The risk propensity scale was used to assess the risk aversion.

Results: Sixteen respondents were included within the current study, eight in both the education and non-education groups respectively. Influential factors that would influence a decision to RTS included: game importance, concussion severity and symptoms, internal and external factors. RTS also varied factors depending on season and game type.

Conclusion: This was the first study to determine the influences that affect RTS post-concussion injury decisions, the role that concussion education plays with these decisions, and the relationship between the general risk-taking capabilities and athletes' decisions to RTS.

Key Practice Points:

- Despite providing concussion education, there were still differences in decisions relating to the hypothetical scenario of RTS following a concussion.
- There is a discrepancy when athletes choose to take risks in sport compared to everyday life.

- Further research is required to understand athletes general risk-taking propensities when dealing with RTS decisions.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people: The findings of this review have direct relevance to anyone participating in sport from the Aboriginal and Torres Strait Islander Population.

## KEEPING THE PRESSURE ON: DOES COMPRESSION THERAPY PREVENT CELLULITIS?

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**Aim:** To determine if compression therapy delays the recurrence of lower limb cellulitis in patients with chronic oedema.

**Design:** A randomised controlled trial with cross-over, concealed allocation, intention-to-treat analysis and a planned interim analysis.

**Methods:** Eighty-four participants with lower limb chronic oedema and a history of recurrent cellulitis were randomised into the intervention (compression) or control (no compression) group, with six monthly follow up planned for up to three years or until 45 episodes of cellulitis occurred. Following an episode of recurrent cellulitis, control group participants crossed over to the intervention group. The main outcome measure was time to cellulitis recurrence. A planned interim analysis was performed by an external statistician following 23 episodes of cellulitis, resulting in early cessation of the trial.

**Results:** After 23 episodes of cellulitis, a log-rank test showed a highly significant ( $p=0.002$ ) group difference in favour of the intervention group. In the control group 40% (17/43) of participants experienced recurrence, compared to 15% (6/41) of intervention group participants, giving a number needed to treat of 4 [95% CI 2 to 15]. Based on time to recurrence, the hazard ratio was 4.42 [95% CI 3.87 to 4.96].

**Conclusion:** In patients with lower limb chronic oedema and recurrent cellulitis, compression therapy is effective in delaying cellulitis recurrence.

**Key Practice Points:**

- Patients with lower limb chronic oedema and recurrent cellulitis should receive compression therapy as standard care to delay cellulitis recurrence.

## IMPACT LOADING VERSUS RESISTANCE TRAINING FOR BONE HEALTH IN YOUNG ADULT WOMEN: THE OPTIMA-EX TRIAL

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**Aim:** To determine the most effective exercise mode (impact or resistance) to improve bone mass in young women with low bone mass.

**Design:** Three-arm, single-blind randomised controlled trial.

Method: Healthy, sedentary women aged 18-30 years with lower than average bone mass were recruited and randomised to 10 months, twice-weekly, either supervised high-intensity impact training (IT), high-intensity resistance training (RT) or unsupervised home-based low-intensity exercise (active control) (CON). The primary outcome was lumbar spine (LS) areal bone mineral density (aBMD) (Medix DR DXA, France); secondary outcomes included dominant (D) and non-dominant (ND) femoral neck (FN) areal and volumetric BMD (vBMD). Data were analysed per-protocol, using repeated-measures ANCOVA and univariate ANOVA for percent change. Results represent adjusted difference  $\pm$  SE (significant at  $p \leq 0.05$ ).

Results: Fifty-one women (age=22.2 $\pm$ 3.6 years; height=1.64 $\pm$ 0.62 m; weight=58.1 $\pm$ 8.7 kg) were randomised (IT=17, RT=17, CON=17). Thirty-two completed the trial (IT=10, RT=12, CON=10). No between-group differences were observed for aBMD measures. Within-group improvements were detected for LS BMD for both IT (0.039 $\pm$ 0.011 g/cm<sup>2</sup>;  $p=0.002$ ) and RT (0.039 $\pm$ 0.011 g/cm<sup>2</sup>;  $p=0.001$ ). Only RT improved D FN BMD (0.038 $\pm$ 0.011 g/cm<sup>2</sup>;  $p=0.003$ ). For ND FN percent change, RT was superior to CON for cortical (3.64 $\pm$ 2.63% versus -7.31 $\pm$ 2.95%,  $p=0.038$ ) and total (5.78 $\pm$ 3.57% versus -8.74 $\pm$ 4.00%,  $p=0.044$ ) vBMD. Compliance did not differ between-groups ( $p=0.085$ ) and there were no adverse events.

Conclusion: RT may provide a more comprehensive osteogenic stimulus than IT but more data is required.

Key Practice Points:

- RT and IT are safe and effective training methods for bone health
- RT may provide a more comprehensive osteogenic effect than IT

Proposed impact on the health outcomes of ATSI peoples: Adoption of effective osteogenic exercise has the potential to improve health outcomes for Aboriginal and Torres Strait Islander women with low bone mass.

## ELEMENTS OF A COMMON EARLY CAREER PATHWAY TOWARD ADVANCED MUSCULOSKELETAL PHYSIOTHERAPY ROLES

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Aim: The development and sustainability of advanced musculoskeletal physiotherapy roles is impacted by the readiness of physiotherapists to undertake these roles. The project aim was to identify the essential elements of and describe a sustainable statewide pathway that supports the readiness of early career physiotherapists to undertake the specific education and training required for an advanced musculoskeletal physiotherapy role.

Design: Explanatory mixed methodology.

Method: Quantitative data was collected via structured surveys from Queensland public sector physiotherapists employed in advanced musculoskeletal roles. Focus group consultations with physiotherapists employed at various levels and physiotherapy managers refined and informed pathway design.

Results: Advanced musculoskeletal physiotherapists (n=68) identified four essential elements of an early career pathway. Focused discussions with early career physiotherapists, advanced musculoskeletal physiotherapists (in orthopaedics, spinal, emergency and post-arthroplasty roles) and service managers (n=79) detailed the capacity of an early career physiotherapist to access the four elements within public health facilities. An early career pathway to prepare physiotherapists for an advanced musculoskeletal physiotherapy role addressing service and education demands was developed.

Conclusion: An early career pathway for advanced musculoskeletal roles in public health facilities is described.

Key Practice Points:

- An early career pathway identifies the workbased experience and education required to undertake advanced musculoskeletal roles.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:  
This project is not specific to Aboriginal and Torres Strait Islander people but improved health service provision should benefit all communities.

## INTERNATIONAL CONSENSUS FOR CHRONIC BREATHLESSNESS EXPLANATIONS AND RESEARCH PRIORITIES: DELPHI SURVEY OF EXPERT HEALTH PROFESSIONALS

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Aim: To seek expert consensus of priority issues in chronic breathlessness explanations and research.

Design: 3-Round Delphi survey

Methods: Authors of publications specific to chronic breathlessness were invited to respond to open-ended questions ('What is important to: include/avoid when explaining chronic breathlessness; prioritise in research?'). Round 1 responses were transformed to Likert scale (1-9) items for rating in subsequent rounds. A priori consensus was defined as  $\geq 70\%$  of respondents rating an item as important (7-9) and interquartile range  $\leq 2$ .

Results: Of the 31 Round 1 respondents (9 countries, 5 professional disciplines), 24 (77%) completed Rounds 2 and 3. Sixty-three items met consensus (include n=28; avoid n=9; research n=26). Explanations should: use patient-centered communication; acknowledge the distress, variability and importance of this sensation; emphasise current management principles; clarify maladaptive beliefs and expectations; avoid moral culpability. Research priorities included the need: 1) for a comprehensive understanding of breathlessness science; 2) to optimise effective pharmacological and non-pharmacological interventions; and 3) determine effective models of care including education and training of health professionals and people caring for, or living with, chronic breathlessness.

Conclusion: Recommendations generated by this consensus survey provide a starting point for conversations between patients, carers, clinicians and researchers within the chronic breathlessness community.

- Key Practice Points:
- Explanations provided by health professionals may underpin helpful or harmful breathlessness beliefs and expectations.
- When explaining chronic breathlessness: Acknowledge impact, Avoid blame, Believe something can be done, Clarify maladaptive beliefs.
- Research priorities build on progress made in breathlessness science to translate findings to optimal practice.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:  
The information from this presentation will be most meaningful if incorporated into a cultural context when working with the Aboriginal and Torres Strait Islander population.

## BRONCHOSCOPIC LUNG VOLUME REDUCTION WITH ENDOBRONCHIAL VALVE TREATMENT: SYSTEMATIC REVIEW OF OUTCOME MEASURES.

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**Aim:** This systematic review aimed to describe the type of outcomes assessed in studies of bronchoscopic lung volume reduction (BLVR) with endobronchial valve (EBV) treatment for adults with chronic obstructive pulmonary disease (COPD).

**Design:** Systematic review

**Methods:** Five electronic databases (EMBASE, EMCARE, Cochrane Library, Medline, Scopus) were searched (inception-October 2018) for primary studies (experimental or observational) reporting EBV treatment in people with COPD. Two independent reviewers screened and extracted data on type of outcomes assessed. Outcomes were categorised by type (lung function, imaging, adverse events, physical activity, health-related quality of life [HRQoL], functional exercise capacity, breathlessness) and described by frequency and specific measure.

**Results:** Of the 603 studies screened, 49 were included in the final synthesis. Over 75% of studies assessed lung function (n=45: FEV1 n=45), imaging (n=44: computed tomography n=37), adverse events (n=39), or functional exercise capacity (n=38: six-minute walk test n=36). HRQoL was assessed in 69% of studies (n=31: St George Respiratory Questionnaire n=28); less than 50% of studies assessed breathlessness (n=21: modified Medical Research Council dyspnoea scale n=16) or physical activity (n=1 accelerometry).

**Conclusions:** Studies of BLVR with EBVs for COPD commonly report treatment effects on physiological outcomes of lung function and radiological findings. Fewer studies examined patient-reported outcomes such as symptoms, or physical activity levels, which may be meaningful to consumers considering this intervention.

**Key Practice Points:**

- Bronchoscopic lung volume reduction (BLVR) with EBVs is indicated in selected patients with Chronic Obstructive Pulmonary Disease (COPD).
- Outcomes assessed should be meaningful to patients, healthcare professionals and researchers.

Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:  
The information from this presentation will be most meaningful if incorporated into a cultural context when working with the Aboriginal and Torres Strait Islander population.

## CHANGES IN RESISTANCE EXERCISE PRESCRIPTION WITH CLINICALLY-BASED EDUCATION.

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**Aim:** Many research projects investigating the efficacy of resistance training for people with neurological conditions have failed to prioritize the most important muscle groups for walking. In the absence of high-level evidence for resistance training to improve walking, it is reasonable to assume that resistance interventions should target the most important muscle groups for walking.

This study had three aims;

- 1) To determine whether a training seminar for clinicians could improve exercise prescription for walking.
- 2) To determine the effect of additional post-seminar support and mentoring.
- 3) To identify barriers and facilitators to exercise prescription.

**Design:** Cluster randomised controlled trial

**Method:** A training seminar was conducted for 178 clinicians at 12 rehabilitation facilities in Victoria. An independent observer recorded therapy time and exercise prescription for one full day at each facility prior to and three months after the training seminar.

**Results:** The seminar led to significant improvements in the amount of ballistic ( $t = -2.38$ ;  $p = .04$ ) and conventional ( $t = -2.30$ ;  $p = .04$ ) resistance training being prescribed. However, ongoing post-seminar support and mentoring was not associated with any additional benefits  $F(1, 9) = .05$ ,  $p = .83$ , partial eta squared = .01. Further, improved exercise prescription occurred in the absence of any change to perceived barriers.

**Conclusion:** Significant increases in ballistic and conventional strength training occurred as a result of the training seminar.

### Key Practice Points

- Clinicians provided a reasonable proportion of resistance training for people with stroke
- Post-seminar exercise prescription specificity significantly improved
- Further investigations are required to determine whether improvements in exercise prescription lead to improved mobility outcomes

## THE EFFECTS OF MESSAGE FRAMING CHARACTERISTICS ON PHYSICAL ACTIVITY EDUCATION: A SYSTEMATIC REVIEW

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**Aim:** To determine the influence of different message framing characteristics on potential physical activity participation.

**Design:** A systematic review of randomised clinical trials and randomised control trials investigating message framing and physical activity participation.

**Method:** A search of relevant databases, reference lists and grey literature was completed, and a systematic review was performed.



Results: Thirteen studies met the inclusion criteria. The majority of participants were healthy adults with the exception of one study who included overweight people. All studies investigated gain and loss as well as at least one other message framing characteristic and how this influenced physical activity participation. The other characteristics included: source credibility (n = 4), presentation of affect (n = 1), number of arguments (n = 1), type of activity (n = 1), narrative versus statistical (n = 3), intrinsic versus extrinsic motivation (n = 1), social endorsement (n = 1), kernel type (n = 1) and ease of imagination (n = 2).

Conclusion: No consistent consensus was found, however, important characteristics to consider when formulating a message to influence physical activity participation are described. Further research is needed.

Key Practice Points:

- Message framing is an important tool that can be used to influence physical activity behaviour change
- Gain-framed messages alone are most appropriate when attempting to influence physical activity participation.
- The combination of message characteristics and target population demographics can influence which characteristics are most effective

Proposed impact on the health outcomes of Aboriginals and Torres Strait Islander people: This review is not specific to Aboriginals or Torres Strait Islanders; however, it will bring awareness to the importance of understanding the target population when educating patients.

## HOW CAN PHYSIOTHERAPISTS HELP WITH PREVENTION, DETECTION AND MANAGEMENT OF DEVELOPMENTAL DYSPLASIA OF THE HIP?

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Background: Cases of late diagnosed developmental dysplasia of the hip (DDH) have increased in Australia in recent years, including in walking age children, despite an ongoing clinical screening program and increasing use of selective ultrasonography screening.

Objectives:

This presentation has the following aims:

- Present the evidence for preventative strategies for DDH
- Increase physiotherapists awareness of increased cases of late diagnosed DDH, including risk factors for late diagnosis
- Discuss the clinical presentation of late DDH and relevance to the physiotherapist
- Provide an overview of treatment strategies, outcomes, referral pathways and research directions for DDH

Key Practice Points:

- Prevention of DDH includes safe swaddling, optimal babywearing, and optimising range of motion
- Rural babies are at risk of late diagnosis of DDH
- Physiotherapists can diagnose DDH and DDH may be related or unrelated to reason for referral

## IDENTIFYING BIOPHYSICAL MARKERS THAT PREDICT PERCEIVED WALKING, BALANCE AND PHYSICAL QUALITY OF LIFE IN PEOPLE WITH MULTIPLE SCLEROSIS

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**Aim:** To identify factors to predict walking, balance and physical quality of life in people with multiple sclerosis

**Design:** Cross-sectional survey

**Methods:** People across Australia with Multiple Sclerosis were surveyed to explore their self-perceived walking (Multiple Sclerosis Walking Scale), balance confidence (Activity Balance Confidence Scale) and physical quality of life (Multiple Sclerosis Impact Scale). They self-rated their disease specific symptoms (predictor variables) of dizziness, fatigue, strength, vision, spasticity, cognition, touch sensation, limb position awareness, and community integration. Demographic characteristics, disease duration, and patient reported disability were also captured. Multiple linear regression analyses were undertaken to explore the relationships between measure of gait, balance and physical quality of life to self-rated symptoms.

**Results:** 220 people with Multiple Sclerosis completed the survey (mean age 45 years). Self-perceived walking was predicted by a multivariate model including community integration, limb sensation, age, fatigue, cognitive decline and spasticity ( $r = 0.835$ ,  $p < 0.001$ ). Balance confidence was predicted by a model including fatigue, age, dizziness, spasticity, community integration, and lower limb position ( $r = 0.747$ ,  $p < 0.001$ ). Quality of life was predicted by fatigue, community integration, pain, disease duration, spasticity, lower limb sensation loss, cognition and dizziness ( $r = 0.927$ ,  $p < 0.001$ ).

**Conclusion:** Different combinations of symptoms predict patient-reported walking, balance and physical quality of life.

**Key Practice Points:**

- Varied biophysical disease markers contribute to self-reported walking, balance and physical quality of life in people with Multiple Sclerosis.
- Understanding contributions may assist the clinician to streamline assessment and management to optimize functional outcomes.

**Proposed impact on the health outcomes of Aboriginal and Torres Strait Islander people:** Predictors identified could be used for Aboriginal and Torres Strait Islander people living with Multiple Sclerosis, however this population was not specifically investigated. Future research is required to confirm predictors for this population living with Multiple Sclerosis.

## A GUIDE TO THE CLINICAL APPLICATION OF THE MODIFIED TARDIEU SCALE

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**Aim:** To develop a standardised spasticity clinic assessment protocol outlining the clinical application of the Modified Tardieu Scale (MTS) for health professionals working with adults with focal spasticity.

**Design:** A consensus-based qualitative research design.

**Method:** To aid the development of this comprehensive resource, inclusion criteria was determined by consensus of key parties. An expert panel was identified and comprised of a multidisciplinary team of three rehabilitation consultants, three physiotherapists, one occupational therapist and one sonographer. Five panel members were established spasticity researchers and authors. A literature review was conducted and a draft developed. Next, a description of the starting position for assessment was clearly defined for every major muscle group in the upper and lower limbs. Muscle origin, insertion, innervation and action were defined. Positions for testing muscles were described in terms of starting position, ending position and angle of catch. Recommendations for individual muscle injection sites were included and aided by photographs of surface anatomy and labelled sonography. The draft was reviewed by two independent reviewers and discrepancies resolved.

**Results:** A 45 page guide to the application of the MTS was developed. Nineteen upper limb muscles and 17 lower limb muscles were included. Descriptions and photographs of individual muscles were displayed across a two page spread.

**Conclusion:** A standardised spasticity clinic assessment protocol outlining the clinical application of the Modified Tardieu Scale (MTS) was developed.

**Key Practice Points:**

- This is the first comprehensive focal spasticity testing protocol.
- The MTS protocol will allow uniform testing by clinicians
- This protocol will act as an important resource for clinicians

## EXPLAIN CHRONIC BREATHLESSNESS: COMMON ELEMENTS AND DIFFICULT CONCEPTS DESCRIBED BY AUSTRALIAN HEALTH PROFESSIONALS

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**Aim:** To describe usual explanations and difficult concepts when explaining chronic breathlessness.

**Design:** Cross-sectional survey of Australian health professionals

**Methods:** A purpose-designed electronic survey was disseminated via newsletters of professional associations (physiotherapy, respiratory medicine, palliative care). In the context of explaining breathlessness to a person living with this symptom, respondents provided free-text answers for their usual explanation and concepts that patients find difficult. Content analysis coded free text into mutually exclusive categories and proportion of respondents in each category was reported.

**Results:** Respondents (n=88; Physiotherapy 59%, Nursing 23%, Medicine 15%, Other 2%) were predominantly clinicians (92%) who frequently (daily or weekly 74%) conversed with patients about breathlessness. Respondents explained chronic breathlessness with reference to the underlying condition (41%), multiple contributing factors (33%) and physiological mechanisms (26%), with 22% of respondents referring to anatomical, physiological or functional impact of disease on oxygen availability. Respondents perceived patients had difficulty understanding 1) the inconsistent relationship between oxygen levels (SaO<sub>2</sub>/PaO<sub>2</sub>) and benefit of supplemental oxygen (39%); 2) relationships between inactivity, breathlessness and value of exercise training (16%); 3) that the underlying chronic condition or breathlessness cannot be cured but can be managed (12%); and 4) the pathophysiology of specific chronic conditions (12%).

Conclusion: Chronic breathlessness is a complex symptom, which many health professionals, let alone people living with or caring for someone with this symptom, find challenging to explain.

Key Practice Points:

- Pathophysiological based explanations especially where reference is made to oxygen levels, may encourage maladaptive beliefs about the need for supplemental oxygen.

## FEASIBILITY AND SAFETY OF EARLY-INITIATED CARDIAC REHABILITATION IN STROKE SURVIVORS TO IMPROVE SURVIVORSHIP (CRISSIS).

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Aim: Investigate the feasibility and safety of early-initiated stroke-adapted cardiac rehabilitation (CRISSIS).

Design: A single centre, multi-site, prospective-cohort feasibility trial of cardiorespiratory fitness training early after stroke.

Method: Ischaemic stroke survivors were screened for eligibility and invited to participate in cardiorespiratory fitness training three days/week during inpatient rehabilitation. Prior to beginning the intervention, participants completed baseline testing, including a submaximal cardiorespiratory fitness test, measures of physiological function, fatigue, mood, quality of life and exercise self-efficacy measures.

Results: Of 103 people screened, 73 (70%) were eligible to participate, and 45 (62%) consented. Five participants ceased the study due to lack of time (n= 1), transferred to acute hospitals (n=2) or no reason given (n=2). All participants were able to achieve the minimum recommended exercise intensity and 42% reached the recommended minimum duration (20 minutes) of cardiorespiratory fitness training as per the exercise guidelines for stroke survivors. Ten sessions out of a total of 121 inpatient cardiorespiratory training sessions were missed due to medical appointments, fatigue or conflicting therapy appointments. There were two adverse events that were unrelated to the study protocol during inpatient training.

Conclusion: Preliminary data suggests it is safe and feasible for stroke participants to integrate into a stroke adapted cardiac rehabilitation model in addition to usual care.

Key Practice Points:

- Cardiovascular fitness testing and training is safe and feasible in acute to early sub-acute stroke.
- Not all participants could meet minimum cardiorespiratory fitness training guidelines.
- Cardiovascular fitness training following stroke had high attendance and retention.

## EXERCISE-INDUCED SYMPTOM PROVOCATION IN TRAUMATIC BRAIN INJURY: PRELIMINARY RESULTS

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Aim: This study aimed to examine the incidence of exercise-induced symptom provocation in moderate to extremely severe traumatic brain injury (TBI) during high-level mobility (HLM) and cardiovascular (CV) exercise.

Design: Observational study

**Method:** Consecutive admissions to the inpatient rehabilitation unit of a Melbourne hospital were screened for recruitment. Patients were eligible if they had sustained a moderate to extremely severe TBI less than three months prior, were out of post-traumatic amnesia and met physical and cognitive criteria to be able to complete testing. Consenting participants undertook exercise testing involving HLM or CV exercise. Symptom provocation was measured using the Sports Concussion Assessment Tool (SCAT) symptom evaluation scale which was completed at baseline and post exercise test.

**Results:** Two hundred and thirty-eight consecutive admissions have been screened for recruitment since August 2017. Of these, 84 have met inclusion criteria and 60 have consented and completed testing. Forty-seven participants were male and 13 female with a mean age of 35 years. Fifty-seven undertook CV testing and 22 HLM testing. Three participants experienced exercise-induced symptom provocation, and one adverse event, a fall, occurred during a HLM testing session.

**Conclusion:** The preliminary results of this study demonstrate that the incidence of exercise-induced symptom provocation in early rehabilitation following moderate to extremely severe TBI is low.

**Key Practice Points:**

- Preliminary data suggest exercise testing is safe and feasible in the early stages of recovery following moderate to severe TBI
- The SCAT appears to be reasonable to use in more severe classifications of TBI

## **PRESCRIPTION FOR COST-EFFECTIVE EXERCISE-BASED FALLS PREVENTION PROGRAM FOR THE OLDER PEOPLE: A SYSTEMATIC REVIEW OF ECONOMIC EVALUATIONS**

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**Aim:** To summarize the literature regarding the cost-effectiveness of exercise-based programs for falls prevention among the older people, and discuss the implications of the review's findings for clinical practice and future research on the dosage for cost-effective exercise-based falls prevention program for the older people.

**Design:** Systematic review.

**Method:** CINAHL, Scopus, Pubmed, NHS Economic Evaluation Database, ISI Web of Science, Science Citation Index and PsycINFO for pertinent studies from their inception until February 2019. Randomized controlled trials with an economic evaluation of exercise-based falls prevention programs for the older people aged 60 years and above were included. Methodological quality was assessed using the Physiotherapy Evidence Database (PEDro) scale and the quality of economic evaluation using the Quality of Health Economic Studies (QHES).

**Result:** Twelve studies including 3668 older people were reviewed. Interventions for falls prevention were either exercise only or multifactorial programs. Five studies of high economic quality and two studies of high methodological quality provided evidence supporting exercise only programs as cost-effective for preventing falls. Exercise-only programs were more cost-effective than multifactorial falls prevention programs.

**Conclusion:** There is evidence to support exercise-based intervention as a cost-effective treatment for preventing falls among older people. Further research is needed to more fully establish the cost-effectiveness of such programs, especially in both developing and underdeveloped countries.

Key Practice Points:

- Moderate intensity of strengthening exercise done twice per week lasting for 60 minutes each session for 6 months or over is likely to be cost-effective in preventing falls among the older people.
- Strengthening exercise for the lower limb and balance training needs to be included in the falls prevention exercise program. Scheduled walking, upper limb exercises and functional exercises may provide additional benefits.
- Ongoing exercises are needed for sustained benefits.

## EFFECTIVENESS OF A NOVEL GAMING SYSTEM ON POST-OPERATIVE REHABILITATION OUTCOMES AFTER TOTAL KNEE ARTHROPLASTY: A PILOT STUDY

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**Aim:** This study aims to evaluate the effectiveness of “Fun-Knee”, a novel gamified rehabilitation system for Total Knee Arthroplasty (TKA) patients, as compared to conventional rehabilitation where patients learn and perform rehabilitative exercises at home using printed brochures.

**Design:** This is a randomised controlled trial.

**Method:** Thirty subjects were recruited and randomised by blinded research assistant. The intervention group was taught how to use the smart knee sleeve and mobile app before discharge and used at home for 2 weeks. Outcome measures including self-reported pain, knee range of movement (ROM) and functional performance, were taken at hospital discharge, first and last outpatient physiotherapy appointment, were compared between two groups using two-independent sample t-test and chi-squared test.

**Results:** The clinical and subjective outcomes did not show significant differences between groups. “Fun Knee” was well-received among the subjects according to survey. Notably, those who reported a greater number of usage and game sessions, had lower pain score, better extension and flexion ROM at follow-ups.

**Conclusion:** “Fun Knee” is a feasible rehabilitation adjunct with demonstrated outcomes in pain and knee flexion/ extension with increased usage. Given the heterogeneity in results obtained, further analysis may help us advance patient-centred care, possibly through identifying specific patient subtypes who are more receptive to technological innovations.

Key Practice Points:

- Technology-enabled rehabilitation is possible and feasible for older adults, with careful selection as motivation of using novel technology varies.
- Mobile app user interface has to be user-friendly for elderly to improve compliance.
- Other possible rewards including monetary and non-monetary rewards should be explored to improve compliance.

## TO INVESTIGATE RELATIONSHIPS BETWEEN UPPER-BODY AND TRUNK FITNESS MEASURES USED IN LAW ENFORCEMENT AGENCIES

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**Aim:** To investigate relationships between upper-body and trunk fitness measures used in law enforcement agencies (LEAs).

**Design:** A retrospective cohort study.

**Method:** Retrospective data were collected from two LEAs (LEA1 n=165; LEA2 n=633). The data of LEA1 included: age, weight, 1-minute push-up (1PU) and sit-up (1SU) repetitions, 1-repetition maximum bench press (1RM Bench) and bench press ratio (BPR). LEA2 included age, weight, 1PU, 1SU, grip dynamometer (GRIP) and prone plank (PLANK). A Pearson's correlation was used to calculate relationships between each of the fitness measures.

**Results:** 1PU were strongly correlated to 1SU (LEA1 r=0.660; LEA2 r=0.590) and BPR (LEA1 r=0.762), moderately to 1RM Bench (LEA1 r=0.652); and weakly to GRIP (LEA2 r=0.138). 1SU were moderately correlated to BPR (LEA1 r=0.572) and PLANK (LEA2 r= 0.578) and weakly to 1RM Bench (LEA1 r=0.394).

**Conclusion:** Police trainees and officers who present with higher levels of physical capability are suggested to perform better in a range of different physical fitness and job-specific tests. However, while there were some correlations between the upper-body and trunk fitness performance measures, the relationships were not strong enough to warrant replacing one measure with another.

**Key Practice Points:**

- Given the diverse fitness requirements of police officers, the conditioning and reconditioning of a diverse range of physical fitness measures must be developed as part of return-to-work planning.
- Even though time may be limited and there are relationships between some of these potential outcome measures, police trainees and officers should be assessed using a variety of fitness assessment measures.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to have no greater impact on the Aboriginal and Torres Strait Islander population above that of the non-Indigenous population

## INFLAMMATORY ARTHRITIS IS ASSOCIATED WITH IMPACTS ON INTIMATE RELATIONSHIPS AND SEXUAL FUNCTION

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**Aim:** To explore impacts on intimate relationships and sexual function in people with inflammatory arthritis (IA).

**Design:** Systematic review; PROSPERO registration: CRD42017074189.



**Methods:** Eligible studies reported individual's perceptions of IA on their intimate relationships and sexual function. Two independent reviewers selected articles from a search of four databases, extracted data and assessed evidence quality. Quantitative outcomes were reported descriptively. A meta-synthesis was performed for qualitative data and confidence in these meta-synthesis findings was assessed.

**Results:** Fifty-five eligible studies were reviewed: 49 quantitative, five qualitative, one mixed-methods. Sample sizes ranged from 8-1272 with reported age range 20-69 years. In studies reporting the Female Sexual Function Index (score: 2-36), all IA groups reported sexual dysfunction (mean score range (standard deviation): 14.2(7.8)-25.7(4.7)). In studies reporting the International Index of Erectile Function (score: 0-30), all IA groups reported erectile dysfunction (mean score range (standard deviation): 16.3(6.2)-24.5(6.0)). Two key themes (sub-themes) were identified: i) impaired sexual function (IA-related pain and fatigue, erectile dysfunction, diminished sexual desire and fluctuations in sexual function with disease activity) and ii) compromised intimate relationships (reduced sexual activity frequency, embarrassment and frustration, altered self-image, sexuality and relationships with partner).

**Conclusion:** IA is associated with sexual dysfunction in both genders, suggesting that holistic management should consider this aspect of wellbeing.

**Key Practice Points:**

- Joint pain, fatigue and immobility impact sexual health and intimate relationships in people with IA.
- These impacts should be considered in physiotherapy care, with relevant education provided about potential sexual functional limitations and strategies to address these.

## PHYSIOTHERAPISTS' VIEWS ON CHOOSING WISELY RECOMMENDATIONS: A CONTENT ANALYSIS

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**Aim:** To evaluate physiotherapists' feedback on Choosing Wisely recommendations and agreement with each recommendation.

**Design:** Content analysis.

**Method:** The Australian Physiotherapy Association emailed a survey to physiotherapist members (~19,000) in 2015. Participants were asked about the acceptability of the wording of Choosing Wisely recommendations using a closed (Yes/No) and free text response option. Using a similar response format, participants were asked whether they agreed with five Choosing Wisely recommendations. We performed a content analysis of free-text responses and reported on agreement with each recommendation. All study procedures were approved by The University of Sydney Human Research Ethics Committee

**Results:** 543 physiotherapists completed the survey (~3%). Physiotherapists felt that blanket rules were inappropriate (range across sections: 13.5% to 27.9% of responses), clinical experience is more valuable than evidence (9.5% to 26.0%) and recommendations would benefit from further refining (8.1% to 29.4%). 347 physiotherapists (63.9%) agreed with the 'don't' style of wording. Agreement with draft recommendations ranged from 52.3% (electrotherapy for back pain) to 76.6% (decision rules for imaging).

Conclusion: Most physiotherapists agreed with the style of wording for Choosing Wisely recommendations and with the recommendations, although their feedback highlighted several areas of disagreement and suggestions for improvement.

Key Practice Points:

- Choosing Wisely recommendations that acknowledge physiotherapists experience and avoid blanket statement may support adoption of the recommendations
- These findings will inform the development of future Choosing Wisely recommendations
- Important barriers to reducing low-value physiotherapy were identified; these should be the target of strategies to improve physiotherapy practice

## IS THE MANAGEMENT OF LOW BACK PAIN EVIDENCE-BASED? A SYSTEMATIC REVIEW OF PHYSIOTHERAPY TREATMENT CHOICES

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Aim: To summarise the proportion of physiotherapy treatments provided for low back pain (LBP) that are high-value and low-value.

Design: Systematic review with quantitative synthesis

Method: We performed an electronic keyword search in numerous databases combining terms synonymous with “practice patterns” and “physiotherapy”. Articles that quantified physiotherapy treatment choices for LBP through surveys or audits of clinical notes were included. Whether a treatment was considered high- or low-value was determined by reference to the 2016 National Institute for Health and Care Excellence guidelines or high-quality systematic reviews. We summarised the percentage of physiotherapy treatments provided for LBP using medians and interquartile ranges (IQR).

Results: We included 48 studies. For acute LBP, the most frequently provided high- and low-value treatments were advice to stay active (median = 32%, IQR: 13% to 55%, 7 studies) and electrotherapy (34%, IQR: 29% to 49%, 7 studies), respectively. For chronic LBP, the most frequently provided high- and low-value treatments were exercise (64%, IQR: 51% to 78%, 10 studies) and electrotherapy (38%, IQR: 23% to 46%, 6 studies), respectively. Other frequently provided treatments included manual therapy, McKenzie, and superficial heat.

Conclusion: There is considerable scope for physiotherapists to replace low-value care with high-value care for LBP.

Key Practice Points:

- Physiotherapists provide electrotherapy for acute and chronic LBP more often than advice to stay active
- Less than two-thirds of physiotherapists prescribe exercise to patients with chronic LBP
- If physiotherapists are to lead the management of LBP, greater attention to providing high-value care is needed

## A POSTERIOR-TO-ANTERIOR GLIDE COMPARED WITH A TRADITIONAL ANTERIOR-TO-POSTERIOR GLIDE FOR INCREASING KNEE FLEXION: A PILOT RANDOMISED CONTROLLED TRIAL.

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**Aim:** To compare posterior-to-anterior- and anterior-to-posterior-directed mobilisations to increase knee flexion and provide data to inform a full-scale randomised controlled trial.

**Design:** Pilot study preparatory to a double-blinded, parallel randomised controlled trial with intention-to-treat analysis.

**Method:** Adults with less than 120° knee flexion, without inflammatory arthritis or previous surgery to the stiff knee, were randomised into two groups. Participants received four sessions of posterior-to-anterior- or anterior-to-posterior-directed mobilisations in internal rotation to the proximal tibia and a corresponding home exercise program. Outcomes were knee flexion measured using a dual-sensor inclinometer, visual analogue scale for pain, and reported function using the patient specific functional scale and knee injury and osteoarthritis outcome score.

**Results:** Twenty-nine participants were randomised (Posterior-to-anterior n = 14; Anterior-to-posterior n = 15). The posterior-to-anterior-directed intervention resulted in greater flexion gain than anterior-to-posterior-directed intervention (Mean gain 16.3° versus 8.6°, 95% CI of the difference 0.8 to 14.5; p = 0.028). No between-group differences were found for pain or reported function. Based on these data, a randomised controlled trial with 80% power would need 33 participants in each group.

**Conclusion:** Preliminary evidence suggests that a posterior-to-anterior-directed mobilisation may be more effective than the traditional anterior-to-posterior-directed mobilisation for increasing knee flexion. However, the pilot data requires support from a full-scale randomised controlled trial.

### Key Practice Points:

- Clinicians may consider performing a PA-directed mobilisation with internal rotation to increase flexion in patients with knee stiffness.

**Trial Registration:** ACTRN 12618000230257

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to have similar application to Aboriginal and Torres Strait Islander people and non-Indigenous people.

## PAEDIATRIC PHYSIOTHERAPY SERVICES ACROSS AUSTRALIA, NEW ZEALAND AND THE UNITED KINGDOM

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**Aim:** To determine current service type distribution, referral and waiting list factors impacting access to paediatric physiotherapy services in Australia, New Zealand and the United Kingdom.

**Design:** Cross-sectional survey.

**Method:** An anonymous online questionnaire, using the Qualtrics platform, was released via email to practicing physiotherapists in Australia, New Zealand and the United Kingdom who provide paediatric physiotherapy services. Data were analysed descriptively using SPSS.

**Results:** A total of 244 (Australia n=76, New Zealand n=21, United Kingdom n=147) physiotherapists providing services to paediatric clients responded. Those working in community-based organisations made up 42.6% (n=104), with 27% (n=66) in hospitals, 11.5% (n=28) in schools, and 10.2% (n=28) in private practice settings. Most services accepted medical practitioner referrals (80.7%, n=197), with 40.6% accepting parent referrals (40.6%, n=99). Waiting times for physiotherapy assessments varied across age groups and countries. Mean waiting time for children 0-12 months, 13 months–5 years and 6–10 years was 1.02, 2.12, & 2.53 months respectively (Australia); 5.27, 5.55 & 2.00 months respectively (New Zealand) and 1.37, 2.26 & 2.87 months respectively (United Kingdom).

**Conclusion:** Waiting times for paediatric physiotherapy assessment are lengthy across all three countries. Alternative methods of assessment, such as telehealth, should be investigated as a potential way to reduce these wait times.

### Key Practice Points:

- Lengthy wait times for paediatric physiotherapy assessment is currently an issue across Australia, New Zealand and the United Kingdom.
- Further research is needed to determine methods to reduce this time and improve access to services.

**Proposed impact, if any, on the health outcomes of Aboriginal and Torres Strait Islander people:** The results of this research are likely to benefit both Aboriginal and Torres Strait Islander and non-Indigenous populations similarly.